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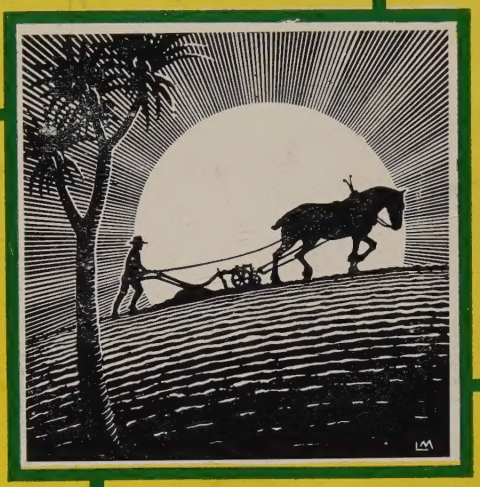

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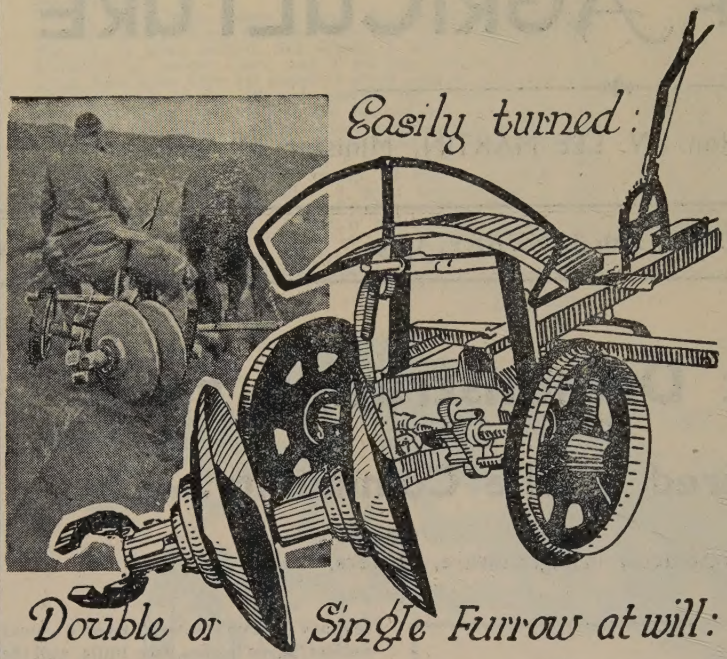

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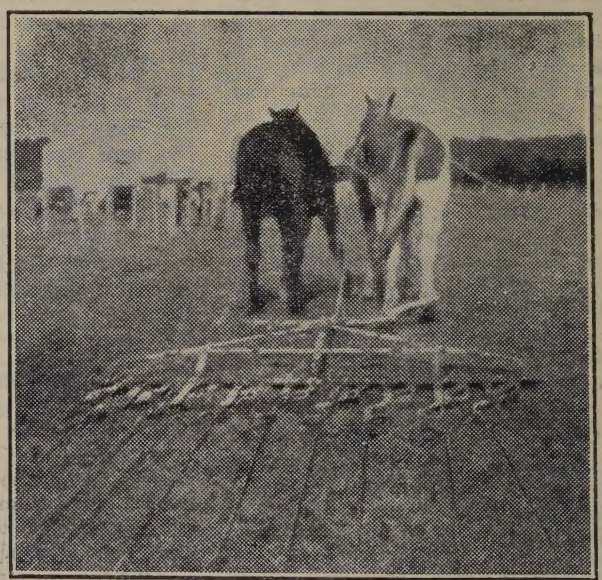

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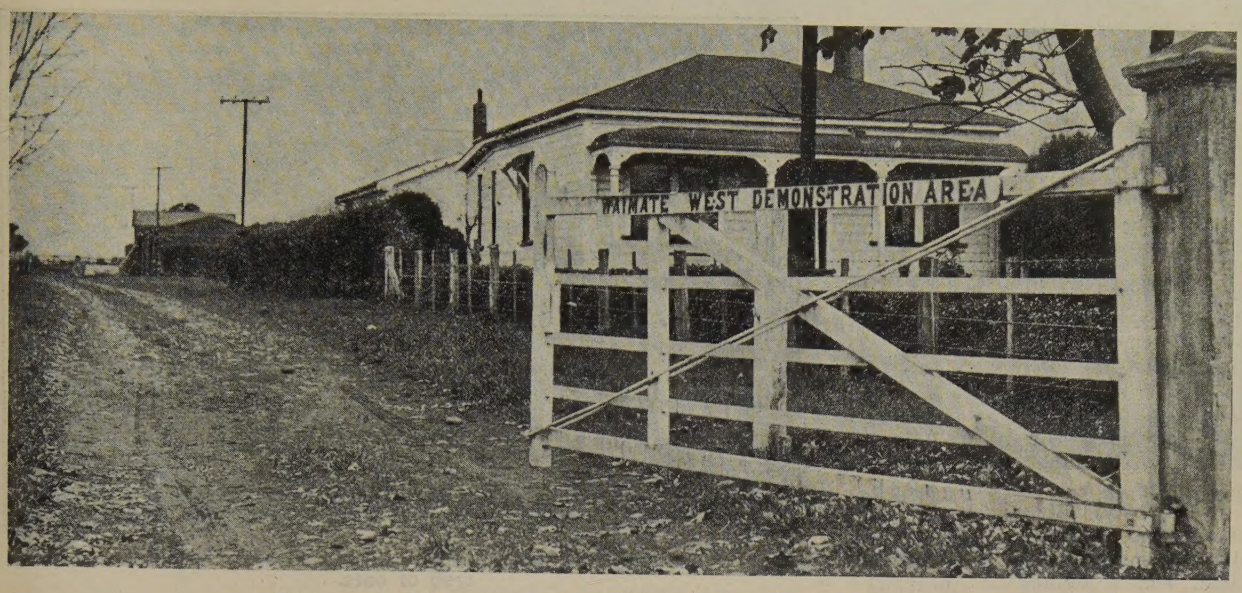

Fig. 1.—The entrance to the Waimate West Demonstration Farm.

fences, and a restricted water-supply; loose grazing was practised, and for many years previously the area had been continuously cropped. It can be readily seen, therefore, that the initial committee undertook considerable financial responsibilities.

Taking over on a leasehold basis, an immediate outlay of capital was expended in the erection of a residence and farm buildings, and in the provision of fencing, water, implements, and live-stock. Several years' development work was completed before adequate dairying-facilities were provided, and production progress was, in a measure, influenced by the policy of experimental and demonstrational work—practices which would adversely affect milk yields would often be incorporated in the farm programme.

In spite of the utilization of the farm for experimental purposes, marked progress has been made, and the farm generally may be considered a good, average South Taranaki farm. Its prosperous development can be readily gauged from a review of the butterfat returns for the past sixteen years. :—

Year.	lb.	Year.	lb.
1922–23 ..	14,534	1930–31 ..	15,636
1923–24 ..	13,546	1931–32 ..	15,982
1924–25 ..	13,839	1932–33 ..	16,639
1925–26 ..	12,747	1933–34 ..	18,969
1926–27 ..	16,270	1934–35 ..	15,921
1927–28 ..	13,856	1935–36 ..	16,509
1928–29 ..	14,289	1936–37 ..	19,813
1929–30 ..	13,458	1937–38 ..	20,175

A Profitable Institution.

Butterfat returns show progressive increases, fluctuating, of course, with seasonal conditions. The last two years have been particularly good, reaching record figures. Consistent with production increases, a marked improvement in the farm's finances has also taken place, the past few years being notably successful.

Year.	Bank Overdraft.	Butterfat Revenue.	Working Account Expenditures.	Farm Assets.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1935	1,253 14 6	720 10 2	675 0 11	3,097 17 7
1936	985 8 7	787 5 10	567 11 7	3,163 1 6
1937	430 12 1	1,285 4 4	708 5 4	3,241 4 11
1938	72 4 10	1,354 10 5	920 18 6	3,405 15 7

During the depression years much of the usual upkeep in repairs and improvements, &c., were postponed, necessitating an added load of expenditure in improvements and replacements for the post-depression years. Taking this into consideration, the improved consolidation of the farm's finances in the latter years is all the more creditable.

Guarantors are, in the main, relieved of any serious financial concern, the farm itself being self-supporting and considered a paying proposition. The position is such that future investigations can be undertaken with greater confidence and unharassed by overdraft worries.

As previously mentioned, the committee's main objective was to hasten development to ensure the farm being soundly established, at the same time incorporating investigations and demonstrations which would not seriously jeopardize production.

Recent Activities.

Activities for the past three seasons have centred on dairying and grassland problems. The major project was connected with the control of feed flavours, and a full report of this trial appeared in the *Journal of Agriculture*, September, 1938, Vol. 57, No. 3.

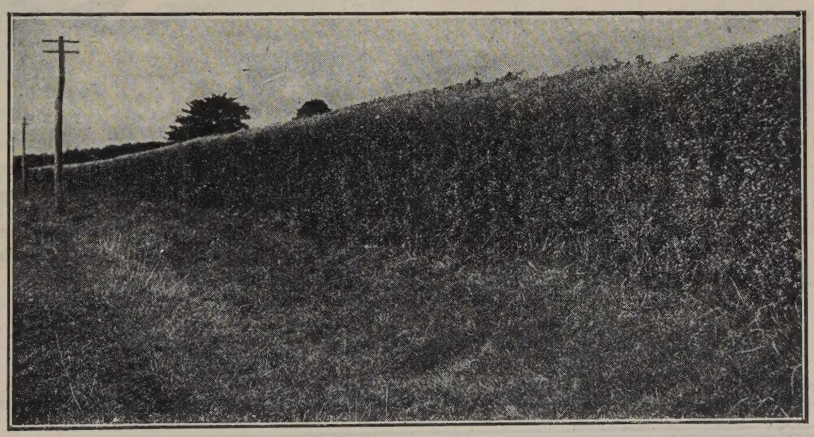

Fig. 2.—A well-trimmed roadside boxthorne hedge.

Pasture-harrowing trials have also been given due attention. Drastic harrowing in varying degrees, as compared with that sufficient to scatter animal droppings adequately, have been tried out, and, although conducted for only two seasons, the trend was that no advantage appeared in drastically harrowing good pastures, but considerable improvement occurred where stock droppings were evenly scattered by timely surface-harrowing. Trials were incorporated in the lucerne stand, covering manuring, cultivation, and nurse cropping.

The importance of good phosphate manuring was well illustrated, and while cultivation after each cut in suppressing weeds was beneficial there was a definite danger in over-cultivation by causing crown injury to the lucerne plants. The drilling-in of Algerian oats in the autumn to serve as a nurse crop for the winter and spring months is to be advocated, and a seeding of about 1½ bushels per acre sown during March or April is recommended.

Comparisons of Algerian oat varieties created interest. Australian, New Zealand, and College were sown, and, while all gave good results, "New Zealand" produced the greatest ensiling bulk. College and Australian varieties, however, gave the best winter cover and matured earlier.

Fig. 3.—Breeding-sows winter grazing on a lucerne stand with a nurse crop of oats.

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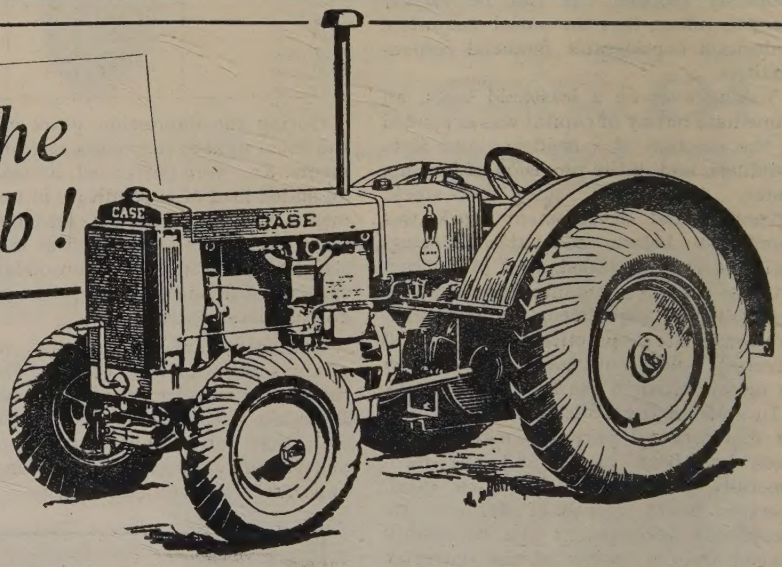

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Pasture Establishment.

Factors in regard to pasture-establishment matters are of particular concern in a district where intensified grassland farming is practised. An area sown to grass last February, embodying pedigree versus certified species, varying rates of seeding from 30 lb. to 60 lb. per acre, and consolidation of the seed-bed, is to-day the centre of attraction, and the follow-up of results commands attention. Establishment has proved outstandingly good—such that the area could be readily taken as a six-year-old pasture.

Early spring grazing was phenomenal. The importance of a firm, well-consolidated seed-bed in early clover establishment is a striking point. Further, even in the past few months the superiority of pedigree over certified strains is well exemplified. Just as certified seed is superior to commercial seed, so is pedigree seed still better than certified seed.

Fig. 4.—Sugar-beet crops which are grown specially for the winter-feeding of pigs.

Seeding Trials.

The rate of seeding trials gave useful data, that of weed-suppression being an important feature, particularly "Fumitory," to which this land is subject. Forty pounds of seeding per acre appears to be ample sowing, especially with pedigree seeds.

Standard trials of the growing of sugar-beet relative to the sugar-beet industry have been undertaken. Resulting from these trials, the value of this crop as a feed in the wintering of pigs has been given prominence (*Journal of Agriculture*, October, 1937, Vol. 55, No. 4).

An area of sugar-beet was grown last season for the specific purpose of pig feed, and the experience to date is that the favourable results obtained the previous year were confirmed. Pigs fed on sugar-beet thrived and fattened well, gaining pride of place over those fed on carrots and mangels.

A Valued Service.

The service rendered to the community by such a farm needs no amplification, and the future offers many problems well suited for experiments on the farm. Apart from investigation work, an effort is being made to modernize equipment, buildings, and layout, &c.

The encouraging feature to-day is that the farm attracts more visitors. It serves as a reception area for touring parties, particularly Young Farmers' clubs, and as a centre for rallying local clubs and farmers' field-days it could not be bettered. In this direction alone its worth is inestimable.

Acknowledgment is made of the excellent work done by members of the committee, and the present satisfactory position of the farm is largely due to their efforts. To Mr. V. H. Hobday, the farm secretary since its inception, and Mr. A. G. Paterson, the farm manager for the past seventeen years, highest praise is given.

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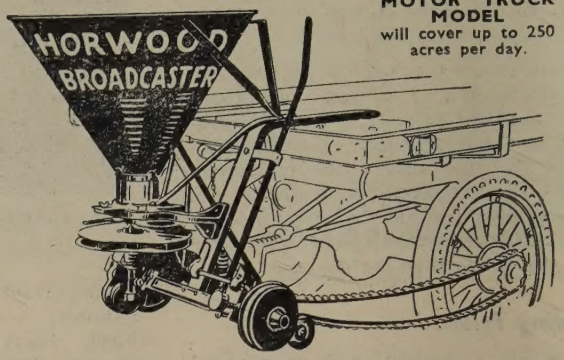

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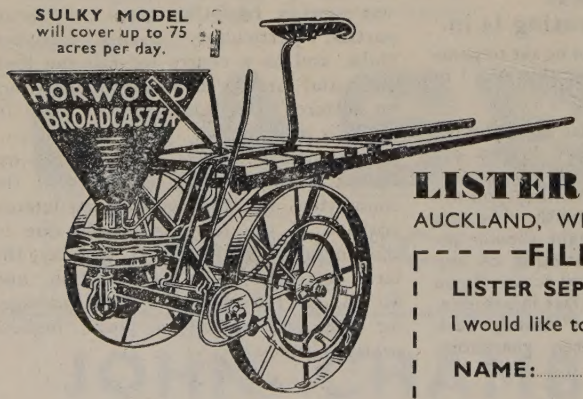

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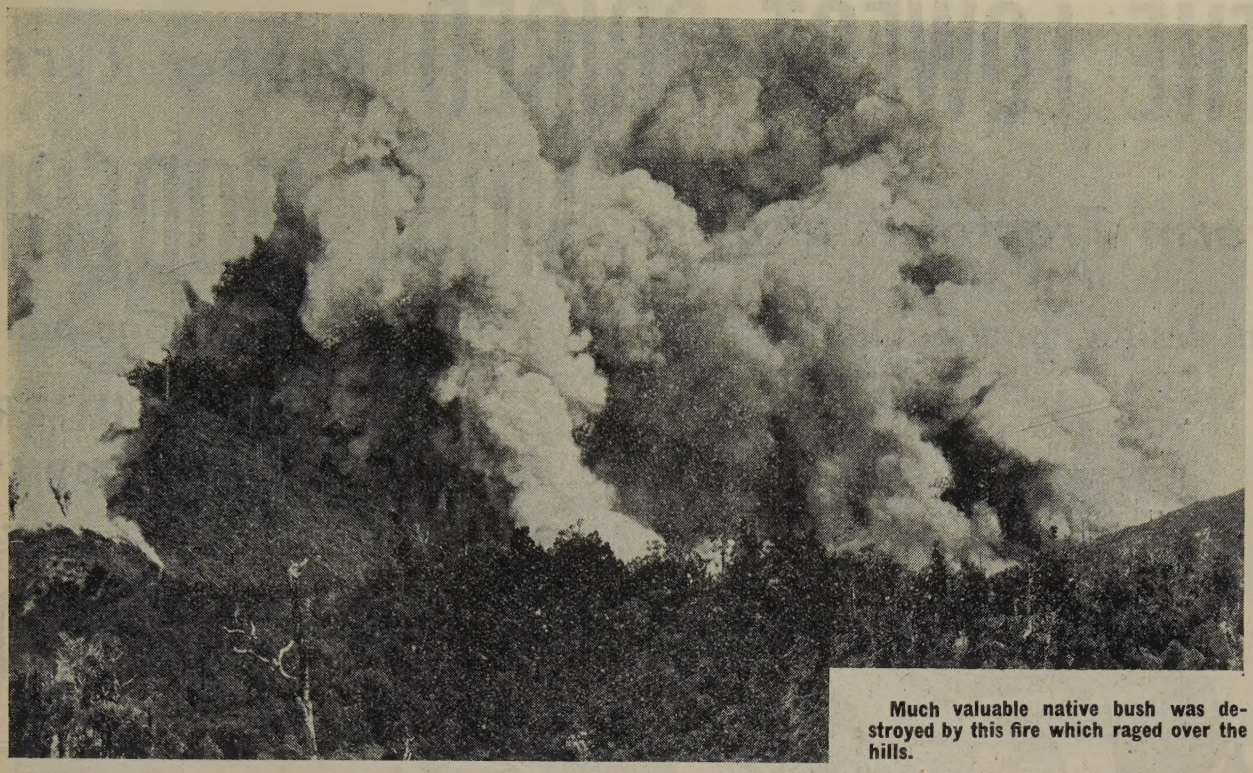

Much valuable native bush was destroyed by this fire which raged over the hills.

Carelessness with Fire Causes Widespread Loss.

Destruction of Native Bush and Plantations.

Hon. W. E. PARRY, Minister of Internal Affairs.

ALL New-Zealanders, of course, should be alert and active for the saving of their forests from fire, but perhaps farmers should be more keenly interested than other folk in guarding woodlands.

In many localities, especially in high steep areas, the forests are an insurance policy against erosion. The timber-milling and farming industries are usually the first to suffer from the fire fiend, but the community as a whole is penalized by the losses of material wealth.

An Alarming Start.

The season of spring was not over before careless persons had begun the annual conversion of live trees into smoke and ashes. Within six weeks from the beginning of October about thirty fires were reported. The sad tally includes the destruction of hundreds of acres of plantations and much native bush.

> Each year carelessly-started forest fires cost New Zealand thousands of pounds in natural wealth. The saving of the forests must be done mainly by the general public, and the Minister of Internal Affairs makes a strong appeal for the exercise of common-sense precautions in the use of fire in open spaces.

Here are some of the losses :—

Tauranga.—Native bush destroyed on local water-catchment area; hospital reserve damaged.

Mount Edgecumbe, Whakatane.—500 acres of western yellow-pine (eight years old, 14 ft. high) destroyed.

Whakatane.— 100 acres, including clumps of native bush, destroyed.

Blackleugh, Clutha Valley.—100 acres of native bush and scrub destroyed.

Paritutu, New Plymouth.— Scenic pohutukawas destroyed.

Among the causes one sees those "hardy annuals"—"rubbish fires out of control" and "bush-clearing operations." Other known causes are billy-boiling by roadmen and cigarette-butts thrown from motor-cars. There is reason to believe that some of the fires were due to deliberate mischief by adults and juveniles

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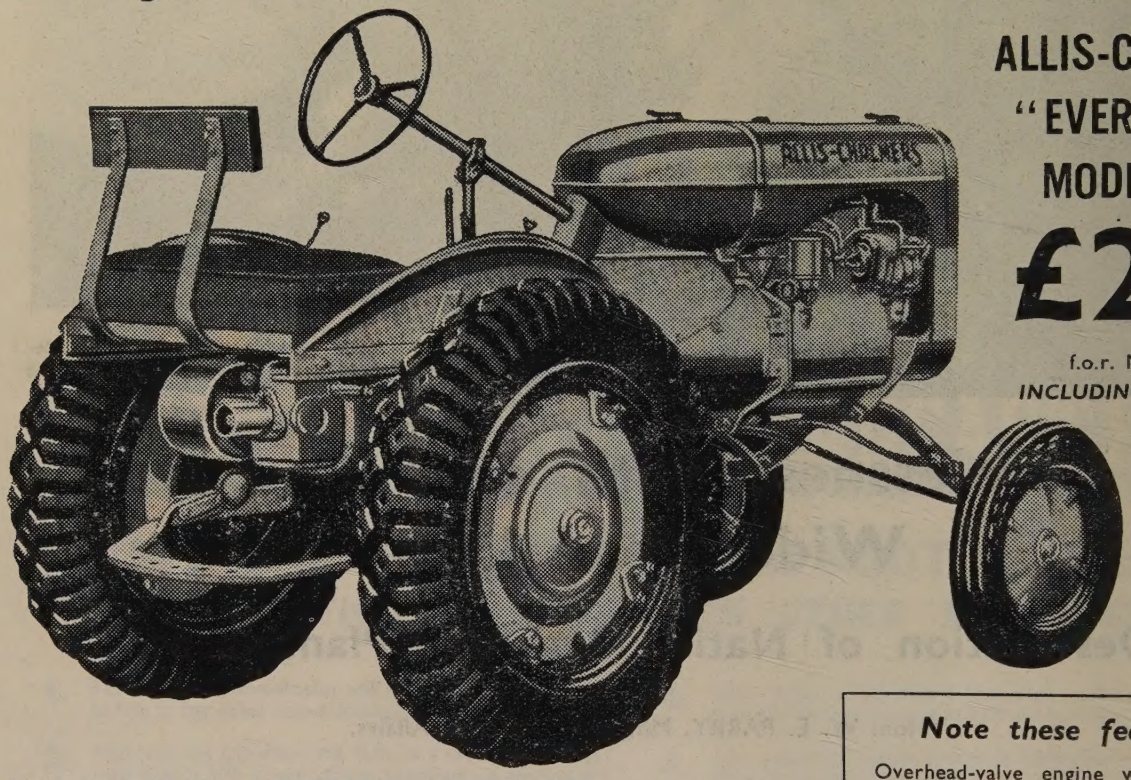

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Scarred trunks and stumps left in the wake of a bush fire.

Statistics of forest fires in the United States of America show that about 90 per cent. of them are man-made. Probably the proportion of man-made fires would be even higher in New Zealand. It is hard to imagine that the sun's rays acting on fragments of bottles or other glass and other mysterious causes would account for 10 per cent. of the fires.

It is one of the tragedies of civilization that human stupidity or folly occasionally reduces the national wealth, the real material wealth. Unfortunately, there are certain persons who may be regarded as "spoilers," persons who cannot be reached by any appeal for conduct which will be fair to the community, but it is possible to induce the great majority of the public to act in accordance with the instinct of self-preservation. That is why the Government is confident that the present campaign for commonsense in the use of fire will not be in vain.

Widespread Loss.

I have mentioned that, although the first effects of a forest fire may be felt by only a few people, the destruction of material wealth is a loss to the whole community. To make that argument more impressive, imagine the loss of Canterbury's wheat crops by fire. The farmers would be the first sufferers, but the disaster would affect the whole of New Zealand. In varying degree every forest fire has a similar reaction.

Scope for National Spirit.

If carelessness with camp-fires, the scattering of glowing butts of cigarettes and dottles of pipes, scrub-clearing, and other operations continues to be rampant in this country it will be indeed difficult to save native forests and plantations during the height of summer if the weather is normal. The man-power available for full-time ranging and other safeguards is limited. The saving of the forests must be done mainly by the general public with commonsense precautions in the use of fire.

There must be also a willingness among people who live near native forests and plantations to co-operate in measures for saving the woodlands. There have been many admirable examples of that kind of team-work, and I feel sure that this national spirit of service will spread.

I believe that when the average New-Zealander has a proper understanding of the physical features of the country he will be a strong supporter of a well-planned policy to save the soil—a policy which must include the guarding of protective forests against fire or other destruction.

Scenic Value.

Another important aspect of the case is the scenic value of native woodlands and plantations. In the view of many tourists from overseas the marvellous native forests are the best scenic asset.

May Centennial year, increasing the tree-sense of New-Zealanders, bring to them a determination to have the utmost caution in the use of fire in open spaces.

❖ ❖ ❖

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Pasture Establishment and Maintenance.

Selection of Suitable Mixtures.

P. S. SYME, Instructor in Agriculture, Warkworth.

(Continued from December issue.)

ALTHOUGH the seed mixtures mentioned have been selected to cover a wide range of conditions, the individual farmer may frequently obtain the best results by compounding a mixture which is specially designed to suit his particular farm. Even where the seed used is of high quality, inferior pastures and much monetary loss frequently result through the inclusion of unsuitable species in the mixture.

Perennial rye-grass and white clover are by far the most useful species throughout New Zealand and form the basis of practically all of the mixtures used for dairying pastures. In deciding which of the other species should be included and the quantity of each to be sown the following should be borne in mind :—

Italian rye-grass is often included in a mixture for permanent pastures, but too much of this may do considerable harm to the resulting pasture by suppressing the other constituents, notably the white clover.

Following the procedure outlined last month, the author goes on to deal with the selection by the farmer of seed mixtures to suit his particular farm. He also discusses the importance of fertilizers, the care necessary in sowing the seeds, and management after sowing.

Paspalum is a very valuable grass where the climate is suitable. Normally, it is slow to establish, but if it is sown alone in November and the rest of the seeds sown in February or March very speedy establishment of the paspalum will result.

Although cocksfoot is very commonly included in seed mixtures, the pastures usually become rye-grass - clover dominant on good land under dairy management, and the contribution of the cocksfoot is relatively small. Under such conditions its production probably does not warrant its inclusion.

Fig. 1.—Bad grazing management allowed the rye-grass to suppress the clovers.

Crested Dogstail.

Although crested dogstail is not a high producer it serves a useful purpose in contributing to the density of the sward, and if through any fall in fertility or through bad management the rye-grass goes out the dogstail tends to take its place and assists in maintaining the ground cover against the invasion of weeds.

Timothy is frequently worth inclusion on cold and heavy land.

Poa pratensis is not generally recommended on good rye-grass - clover land.

Subterranean clover should not be sown on land which will carry good white clover, as serious trouble from bloat may result in the spring if it becomes too vigorous. It will, however, succeed where the fertility is too low for white clover, and may prove a very useful legume while the fertility is being built up to the white-clover standard.

Alsike will frequently succeed where white and red clover fail, and is sometimes sown as a form of insurance. Alsike is not a permanent clover, and before using it the farmer should consider whether he can so improve the soil conditions that white clover will readily establish.

Trouble is sometimes experienced when too much red clover is sown, as its vigorous growth may suppress other essential sward constituents.

Lotus major can be very profitably included for wettish land, particularly if the natural fertility is somewhat below that needed for white clover.

Importance of Fertilizers.

Emphasis has already been laid on the importance of a well-prepared seed-bed, the value of early sowing, and the use of good-quality seeds. Even the best of seeds, sown early on a good seed-bed, may fail to establish unless steps are taken to ensure that the level of fertility will correspond to the demands of the

species sown. Weeds and inferior grasses will establish readily on a poor soil, but the really valuable grasses and clovers essential in a high-class pasture demand a high standard of fertility.

On practically every class of land throughout New Zealand artificial fertilizers are absolutely necessary. Just which of these should be used calls for careful consideration, and is frequently best decided by experience. It should be the aim of each farmer to find out for himself what fertilizers give the best results on his farm. This is best determined by a small experiment rather than by a big speculation, and a deaf ear should be resolutely turned to any form of inspired sales propaganda.

Speaking generally, phosphates may be regarded as indispensable, and on many soils lime may also be necessary. Some caution should be used however before purchasing large quantities of potash unless it is definitely known that the land will respond to this fertilizer. Numerous experiments carried out by the Department of Agriculture in different parts of the country suggest that the profitable use of potash is somewhat restricted, and is mainly confined to some of the very old or to certain of the lighter types of soils.

Fig 2.—The result of a period of hard grazing. The sward has become clover dominant.

The quantity of each of these fertilizers to be used must depend on circumstances, but the following rates per acre are commonly applied :—

Ground limestone, 5 cwt. to 1 ton or more.
Phosphates, 2 cwt. to 4 cwt.
Potash, 2 cwt.

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Care in Sowing the Seeds.

In sowing the seeds care should be taken that they are not buried too deep. This does not readily occur where the land has been properly consolidated, but it frequently happens if the soil has been loosely worked, particularly on the lighter classes of land, and it is probable that more seed is wasted through being covered too deeply than through insufficient covering.

It should be remembered that, failing ample rain, the seeds—and ultimately the young plants—must depend on a supply of moisture rising from below. This moisture will rise only if the soil is firm, and on all but the heaviest of soils the roller should be used for the final cultivation.

Management after Sowing.

Good seeds, sown early on a well-prepared seed-bed, will soon make extremely rapid growth with favourable weather, and even though weather conditions should be definitely bad, the sowing will still not prove a failure. Even so, however, the success of the pasture is not completely assured. Good management is at this stage more than ever essential, and many promising strikes have proved a failure or have achieved only moderate success because of the failure of the farmer to realize certain simple but very important basic principles.

The efficient management of grassland presents more difficulties than does any other crop. A good, well-balanced sward contains a number of different species of plants; it is not a single crop, but an aggregate of crops. As the component members of the sward differ greatly in their ability to withstand grazing, their tolerance of shade, and their manurial requirements, it is easy to understand that unless some care is taken the balance may unwittingly be so tipped against a species as to result in its complete suppression, to the future detriment of the pasture.

Fig. 3.—A good, well-balanced grass and clover sward.

As already stated, the most valuable pasture plants on dairying-land are perennial rye-grass and white clover. Both of these demand a high standard of fertility, and both withstand grazing. If the clover is kept shaded by dense, tall rye-grass for lengthy periods it goes out, and when the clover goes from a pasture the rye-grass quickly follows. Both are essential in a good pasture, but they will not both persist in the desirable proportions under a haphazard system of indiscriminate grazing and mowing. This applies to a pasture of any age, but is particularly important where the pasture is in its early youth. While rye-grass establishes easily and quickly, the white-clover seedling is a delicate and somewhat slow-growing plant, and care must be taken lest it be smothered by its more vigorous and precocious partner.

Management through the winter should aim at controlling the growth of rye-grass without, at the same time, punishing the clover. Where possible, only light stock should be allowed on the young pasture during the winter. Much harm frequently results from the ground becoming pugged by the treading of stock in wet weather before the land has been properly consolidated, and it is sometimes good policy to stock heavily for short periods while the ground is dry, and then to spell the paddock a sufficient time to allow of recovery and fresh growth. This results in less selective and more even grazing over the entire field.

Need for a Second Top-dressing.

Even though a liberal dressing of phosphates may have been applied at the

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time of sowing the seeds it will usually be found profitable to apply a second dressing of phosphates in the spring. The success of the pasture is largely dependent on the early establishment of the clover, and this, in turn, is only possible where a plenteous supply of phosphates is readily available.

Do not Overgraze in Summer.

Throughout the summer the young pasture will provide a considerable amount of valuable feed, and where other grass is scarce there may be a temptation to overgraze. This is invariably very unwise, as the hot weather quickly dries up the surface, with results highly detrimental to the young clover plants.

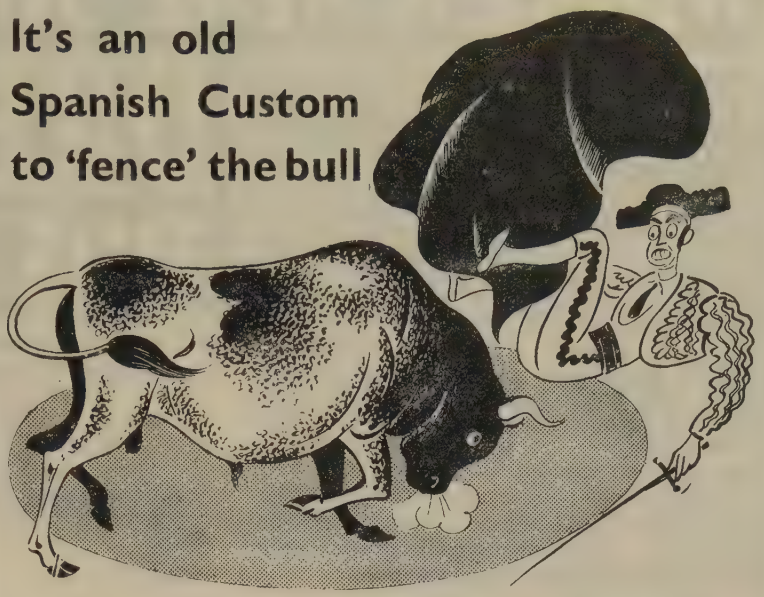
Where the pasture has become tufted and uneven it may with advantage be topped with the mower. It should not, however, be cut for hay or silage during the first season, as this will go far to undo much of the good work already performed. The really good pasture is a continuous source of pride and of profit to its owner. It is seldom the result of chance or of good luck, but is rather the reward of a period of consistent good management, during which expediency or the prospect of immediate gain has been steadfastly subordinated to the ultimate objective—a perfect pasture.

No Vermicide with Chaff.

A CORRESPONDENT, "Hogget" (Ashburton), writes: The last few years I have been wintering a considerable number of hoggets, and I have been drenching them with the nicotine-bluestone drench. I also feed chaff out to the hoggets in winter in feeders in the run-out paddocks off the green feed, and I would like to know if there is any vermicide I could mix with the chaff without rendering it unpalatable which would be of benefit in keeping internal worms in check or of ridding the sheep of them.

The Live-stock Division replies: It would obviously be a most convenient and economical way of dealing with internal parasites of sheep if such a method of treatment were in any degree efficacious, but such is not the case. Difficulties associated with the selection of a suitable anthelmintic, of palatability, and particularly with regulating the dose per sheep, have so far proved insurmountable. The present position is, therefore, that there is no anthelmintic which may usefully be incorporated with chaff.

It's an old Spanish Custom to 'fence' the bull



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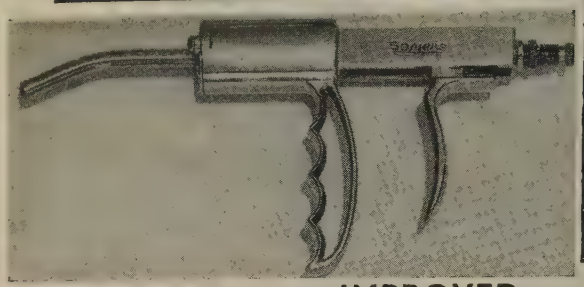

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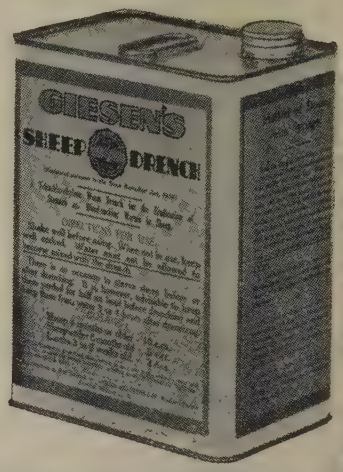

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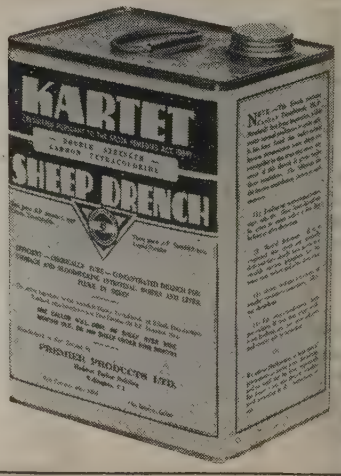

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Vernalization of Potatoes.

Results of Experiments at Pukekohe.

E. M. OJALA, Fields Division, Wellington.

EARLY in the present decade plant physiologists were stirred by the researches of a Russian scientist, T. D. Lyssenko, who showed that by applying certain conditions of temperature and illumination to the seeds of a number of agricultural plants before sowing it was possible to accelerate materially the rate of their subsequent development to maturity. Thus, by using this hastening process called "vernalization," the Russians were able to ripen wheat in the short growing season of the Arctic Circle.

Lyssenko claimed that the application of vernalization to potatoes hastened the maturity of the crop by at least a month, and also increased the yield. The only pre-treatment required was to keep the seed tubers in continuous light at a temperature of about 20° C. for three to four weeks before planting.

Vernalization has no practical value in the growing of early potatoes at Pukekohe, and "sprouting" appears to be of no advantage. These are the conclusions reached from two experiments carried out on a farm at Pukekohe during 1936 and 1937.

Two Experiments.

It was thought that if these claims could be substantiated in New Zealand vernalization would have some practical significance in the growing of early potatoes in certain districts. To investigate this matter, two experiments were conducted on a farm at Pukekohe in the years 1936 and 1937 on early potatoes.

Vernalization was effected by holding the seed tubers on a raised wire-netting frame, strong electric light being reflected on to the potatoes from above and below. Continuous illumination was maintained for twenty-seven days in 1936 and thirty-two days in 1937, the warmth from the lamps maintaining a temperature of 21° C. to 23° C.

In 1936, vernalized and control seed were compared in three replications, the experiment being planted on 19th June. The treated rows appeared above ground earlier than the untreated, and were more severely set back by a frost which occurred before many of the potatoes in the untreated rows were up. However, the vernalized plants reached maturity several weeks before the control plants. The crop was dug on 16th November.

No Significant Differences.

At digging-time it appeared that the untreated rows would have increased in yield more than the treated if digging had been delayed, while, on the other hand, if the digging had taken place a few weeks earlier the treated area may have outyielded the untreated. There were no significant differences in yield.

As frost was possibly an upsetting factor in 1936, the trial was repeated in 1937, but with the addition of a second treatment—"sprouting"—which was effected simply by placing a sample of a tuber's eye end-upwards in an open box. The duration of sprouting was the same as for vernalization—thirty-two days—the box being kept in a glasshouse. Thus, the sprouted seed received, under natural light, a little more than half the period of illumination given artificially to the vernalized seed. By the end of the treatment period small shoots had developed in both lots of seed, the vernalized tubers being more advanced.

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The row on the left is sprouted seed, the row in the middle the control seed, and the row on the right vernalized seed.

Second Trial.

The trial was planted on 5th July, 1937, in ten replications. When the control plants were just emerging through the ground seven weeks later the sprouted rows were 1 in. high and the vernalized rows 2 in. high. As development proceeded these relative positions were at first maintained, the vernalized plants being definitely ahead of the sprouted, which were slightly in advance of the controls. The outward differences between the three treatments gradually became less marked, however, until in October the sprouted rows were indistinguishable from the controls, the vernalized still being slightly ahead.

Early in November the whole trial had a uniform appearance, and the crop was dug on 27th November. The differences in total yield and in the yield of table potatoes for the three treatments were not significant, although the yield of small potatoes from vernalized seed was significantly greater than the yield of small potatoes from the other two treatments.

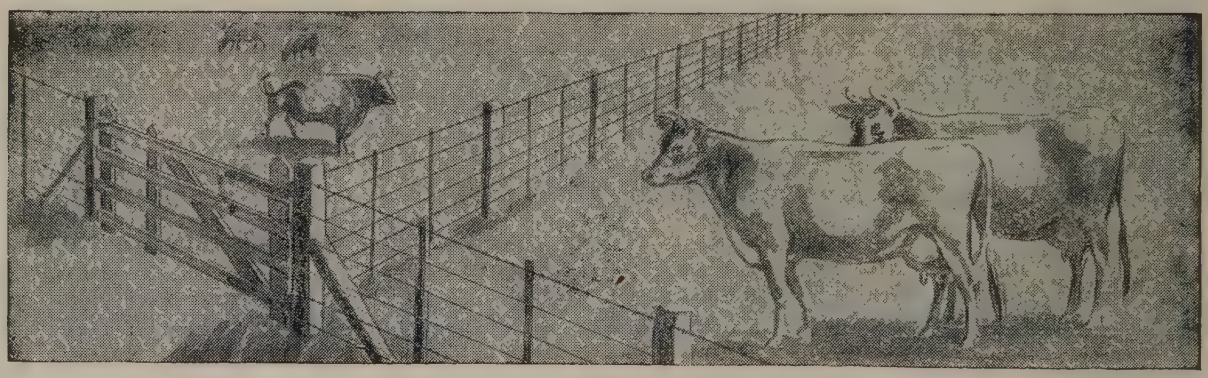
The conclusion to be drawn from the two experiments is that vernalization has no practical value in the growing of early potatoes at Pukekohe, and further that sprouting appears to be of no advantage.

Summary of Yields.

A summary of average yields in tons per acre for both trials is as follows :—

Treatment.	Table.	Small.	Total.
A.—1936 Trial.			
(1) Vernalized seed ..	6·7	1·6	8·3
(2) Untreated seed ..	7·7	1·3	9·0
B.—1937 Trial.			
(1) Vernalized seed ..	12·1	1·5	13·6
(2) Sprouted seed ..	11·6	1·0	12·6
(3) Untreated seed ..	12·2	1·1	13·3

Acknowledgment is due to Mr. J. E. Bell, Instructor in Agriculture, Auckland, who kindly agreed to undertake the laying-down, observation, and weighing of both trials.



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Pig Census Returns.

Production of Pig-meat per Sow.

M. J. SCOTT, Superintendent of the Pig Industry.

THE census returns from 182 farms discussed in the last two issues of the *Journal* under the headings "Pig-meat Produced per 100 lb. of Butterfat" and "Amounts of Meal Used" have now been examined from the viewpoint of amounts of pig-meat produced per sow.

The farms are grouped as follows: Farms on which sows produce—

(*a*) Less than 800 lb. of pig-meat:

(*b*) Between 800 lb. and 1,200 lb.:

(*c*) More than 1,200 lb.

The results are set out in tabular form below:—

Group	A.	B.	C.
Number of farms	66	65	51
Averages of—			
Pounds of pig-meat produced per sow	529	979	1,586
Number of cows per farm	45	57	62
Number of sows per farm	5.7	4.6	3.1
Cows per sow	7.9	12.4	20.0
Production per sow: Number of pigs—			
Born	10.7	14.2	15.3
Bought	0.6	1.4	4.3
Sold	8.1	11.3	15.6
Died	2.6	3.1	2.8
Feed used to produce 100 lb. of pig-meat—			
Total (lb.)	880	766	620
As milk (gallons)	721	640	530
Meal (lb.)	50	40	36
Other feed (lb.)	111	86	54
Average weight of pigs sold (lb.)	65	86	102
Pig-meat produced per 100 lb. butterfat	35	39	47
Earning-value of 1 gallon of milk*	0·68d.	0·81d.	1·00d.

* Pork at 6d. per pound; meal at £14 per ton; other feed at £2 10s. per ton — no deductions for labour or overhead.

From the last line of the table it will be seen that there is a gradual increase in the earning-value of skim-milk as the amount of pig-meat sold per sow is increased. It will be observed that there is actually a decrease in the amount of meal used to produce 100 lb. of pig-meat, hence the increased earnings cannot be attributed to the amounts of meal used (see last month's *Journal*). In that issue it is made clear that meal is definitely a causal factor, but that factor does not operate in this case, as the meal used is similar in each group.

Numbers of pigs born, bought, and sold increase from A to C, but this is to be expected, as the weight of pig-meat sold per sow depends wholly on these factors, combined with the weight at which pigs are sold. Sales as weaners or stores might mean a low production per sow, but if combined with extensive buying of pigs the weight of pig-meal sold per sow could be considerable. The actual weight of pigs when purchased does not influence the production per sow. It is numbers only that matter.

Contrary to last month's analysis, high returns are not associated with small herds of cows. In this case the more cows per farm the better the returns. Cows per sow are in the same category. If this present analysis is trustworthy it can apparently be said with some assurance that the number of cows per sow is not a causal factor in the earning-capacity of pigs.

As in last month's analysis, one must be impressed with the relationship between the earning-value of skim-milk and the amount of feed (whatever its kind) required to produce 100 lb. of pig-meat. As pointed out previously, this is determined solely by the care exercised by the owner. When care is exercised, little else appears to matter.

Tuberculosis in Pigs.

The number of pigs slaughtered for the season 1937–38 at registered premises was 1,085,107. Those slaughtered on holdings and examined at butchers' shops numbered 23,081, making a total of 1,108,188, an increase of 20,190 over last year's figures. In addition, approximately 20,000 pigs are slaughtered annually on farms and consumed thereon, bringing the total estimated slaughterings to approximately 1,128,188. Of 1,079,895 coming under inspection, 198,772 carcasses were found to be affected in varying degrees with tuberculosis, the percentage of infection being 18·41 an increase of 0·08 per cent. as compared with last year. Meat-export works, 883,080; abattoirs, 173,734; ordinary slaughterhouses, 28,293; shops, 23,081: total, 1,108,188.—*Annual report of Director of Live-stock Division.*

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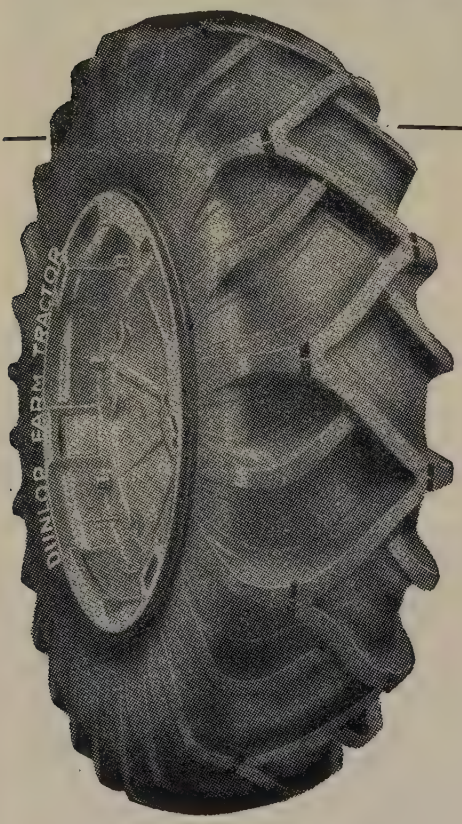

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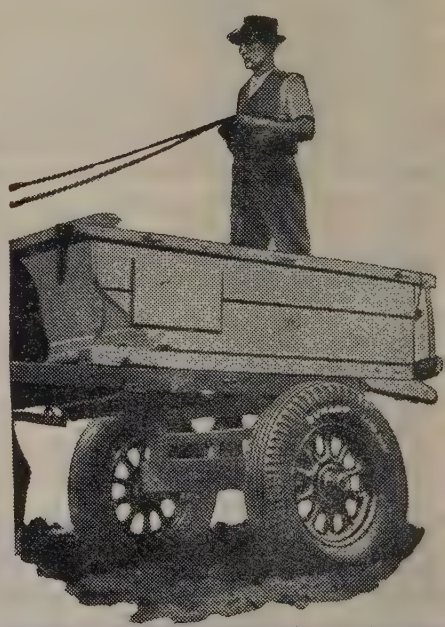

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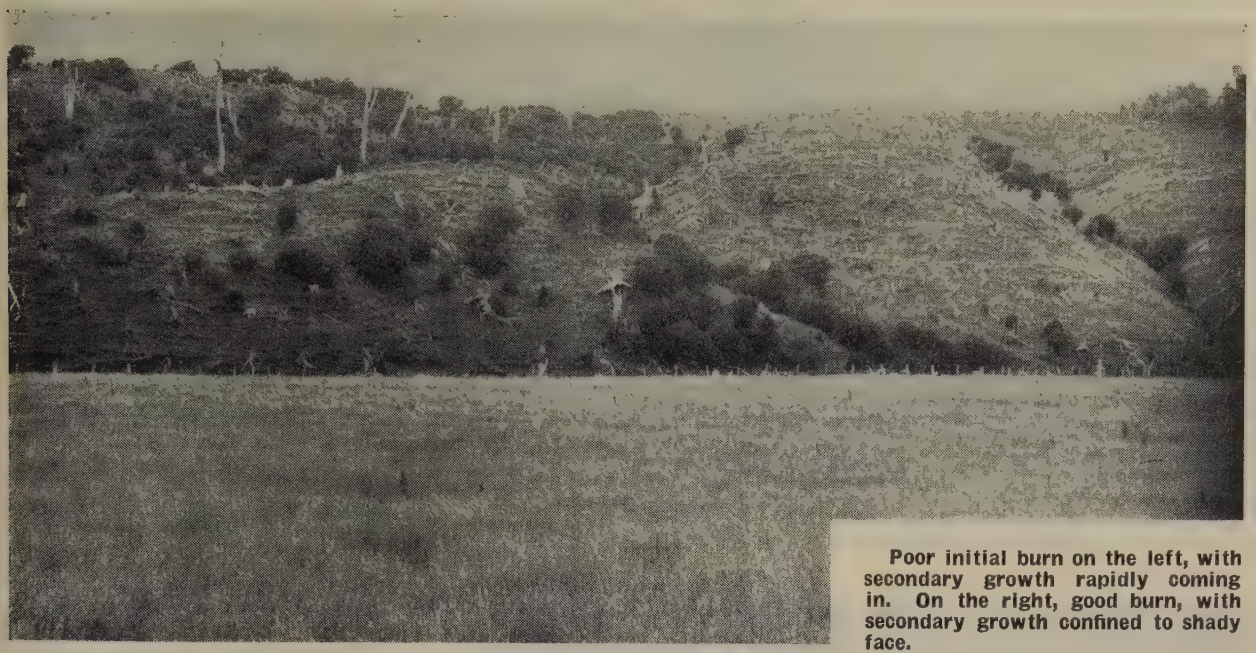

Poor initial burn on the left, with secondary growth rapidly coming in. On the right, good burn, with secondary growth confined to shady face.

Farming in the Catlins District.

Conversion of Bush Land into Farms.

A. F. GREENALL, Instructor in Agriculture, Balclutha.

(Continued from December issue.)

FOLLOWING on the grassing of a bush burn comes the all-important aspect of management, which besides aiming at doing stock well must also aim at preventing scrub growth. One of the first essentials in this district is to ensure that the depredations of rabbits are reduced to a minimum. While control can be achieved in some cases by poisoning, trapping, fumigating, &c., this work requires to be carried out in conjunction with ring fencing the boundary with a rabbit-proof fence.

Good fencing may cost 5s. a chain or so more than fences not rabbit-proof, but they will last for twenty years or more and will undoubtedly pay for the increased cost in a few years. One has only to compare the condition of pastures which rabbits have had access to and which are eaten bare and contain bidi-bidi, daisies, &c., with the condition of pastures to which rabbits have not had access in order to be definite on the point of fencing.

This is the second of a series of articles dealing with the conversion of the heavily-timbered country of the Catlins district of Otago into farm lands. This month methods of tackling weeds or types of scrub that are likely to become aggressive are discussed in detail.

The feeding-out of crops and hay on to areas that show any tendency to revert is good practice, for the stock feeding over the area control fern and weeds and so remove cover for any secondary growth.

Intensity of grazing should not be carried to extremes. Close and continuous grazing with sheep will result in a tendency to push out the cocksfoot and better pasture plants and encourage daisies, bidi-bidi, &c., while too frequent spelling or too light grazing will give the scrub and ferns a chance to establish and develop past the stage when trampling and eating is effective. Generally speaking, grazing with cattle is an essential feature of the management of this country for, besides being most effective in the control of secondary growth, cattle do not eat so close to the crown of cocksfoot as do sheep.

Should the scrub show any sign of coming away in gullies, around logs, &c., it should be cut in late summer, heaped, and burnt. Logging up can be carried out from time to time as opportunity permits and as posts or firewood are required for use on the farm.

It is possible to discuss only in a general manner the problems of management as they are peculiar to each farm and each district. However, a discussion of the methods of tackling each weed or type

of scrub that is likely to become aggressive may bring to light additional points of interest.

Fuchsia.

There are doubtless many species of fuchsia present, but *Fuchsia excorticata* is the most common. In its natural state this plant varies in size from a stunted bush to a fairly large tree. However, under secondary-growth conditions it is invariably a dense bush from 6 ft. to 8 ft. high, with a fairly dense cover of leaves in summer, leafless in winter, and with a superficial-rooting system. During the dormant-growth period from April till end of winter very little leaf is present, the scrub existing as a skeleton which will not carry a fire.

Methods of eradication aim at cutting as close to surface level as is practicable when the plant is in full leaf, heaping if the scrub is scattered, and burning after two months. Grazing stock will then eat most of the young growth, which can also be advantageously checked by judicious use of a flame-thrower. Decay following on death is rapid, and, as the plant is surface-rooting, in a few years the stumps will be knocked out by stock.

A general view in Owaka district, Tawanui—poor burn requiring tracking in the foreground, surface-sown area yet to be logged up and stumped in left middle distance, stumped and logged-up area in oats in right middle distance, and milled bush in background.

Showing the invasion of bidi-bidi in open sward in the background, but a close brown-top sward in the foreground relatively free from this weed.

Wineberry.

Aristotelia racemosa is this plant's botanical name. It is called moko-moko in the Catlins and wineberry in the North Island. In growth it is similar to a wild-pear tree, has a deep root system, a hard woody stem, and a dense leafy cover. Treatment is similar to that required for fuchsia, except that stock do not so readily eat young growth, while the stumps take a considerably longer period to decay. All farmers visited were emphatic on the fact that both wineberry and fuchsia could be controlled and kept in check provided that correct treatment as regards cutting, burning, surface sowing, fencing, and stocking was carried out.

On back-lying faces the problem of control is more difficult, for here the growth is denser and more vigorous and the scrub does not usually dry out sufficiently for a really hot burn. Stock do not work a shady face to the same extent as they do the sunny faces, and thus crushing is also more difficult.

Cassinia Fulvida or Boxwood.

The local name for this is boxwood or tauhina. In the Chaslands district and on some of the tussock runs on the inland fringe of the Catlins there are large areas of vegetation with boxwood dominant. Observations without tangible evidence lead to the hypothesis that this country is more lime-deficient than the bulk of soil in this district. Under farm conditions this scrub can be treated in a similar

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manner to fuchsia. However, it is much slower-growing, holds its leaf all the year, and is not liked by grazing animals.

On the "Wisp Run" adjacent to the Owaka Valley control is effected by burning, the scrub being burnt standing with a favourable wind on a hot dry day, during the summer or autumn. Good burns can be obtained in this way, but they rarely, if ever, result in a complete kill, the same area being ready for burning again in ten to fifteen years' time. As a rule boxwood does not form an impenetrable barrier, as sheep are able to graze all through the scrub. Its presence, however, results in a lowered carrying-capacity and a drop in the selling-value of the wool due to leaves and twigs picked up.

Manuka.

There is not a great deal of manuka present in this area, but where it exists effective eradication can be obtained by fringing the standing blocks of manuka, burning these fringed blocks, and surface sowing with a suitable seed-mixture. Subsequent second growth can be successfully dealt with by spelling and burning. Either spring or autumn is a satisfactory time to burn, time being dependent on—

Typical reversion to secondary growth.

(1) Weather for a suitable burn.
(2) Sufficient moisture to obtain a strike.
(3) A long-enough period before frosts are likely to be experienced to allow satisfactory establishment of clover.

Bracken Fern or Rahurahu.

An appreciable area of both back lying and sunny faces are covered with fern in this district. There is no extensive area where fern has taken control, but it exists in isolated patches throughout the district, being principally confined to

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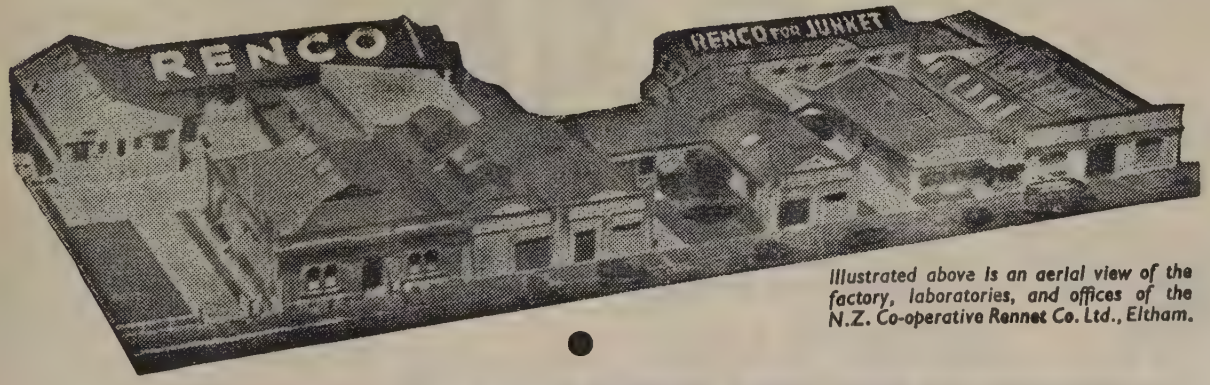

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the areas that have yet to be logged up. Generally speaking, it is more prevalent on the sour soils, and on the soils of a peaty nature. Here it is almost impossible to eradicate, as the soil is too infertile to provide any competing growth.

Burning, followed by surface sowing and a regular-stocking system, principally with cattle, will control fern on the country worth considering, while the use of pigs in enclosed areas efficiently deals with this weed. The areas covered are not usually large and are often confined to rough gullies, which could be suitably fenced and used as pig-paddocks.

Sows could be brought into such an enclosure three weeks before farrowing, more adequately fed, and the litter at the date of weaning fed on surplus milk and suitable roughage and concentrates. This is a suggestion not backed by any evidence in this particular district, though such a practice is proving successful in another area in South Otago. Fern appears to be the dominant second growth on old burns, in association with bidi-bidi, and is found spreading from centres under old decaying logs and stumps where animals cannot penetrate.

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Bidi-bidi.

Bidi-bidi is most aggressive all over the Catlins. Although it does not result in a startling or impressive reduction in the carrying-capacity, it must result in much financial loss. This weed becomes particularly aggressive under close sheep-grazing, remedial measures being spelling and light cattle grazing. A robust growth of grass roughage lifts the creeping stems of bidi-bidi from the ground, and direct and indirect injury by grazing cattle causes destruction to a large number of plants.

Overstocking by sheep, and the depredations of rabbits are the chief causes for spread, with rabbit-fencing, spelling, and light grazing the remedy. This weed appears to be most severe on close-grazed swards of cocksfoot and fog, is not aggressive to any extent where cocksfoot roughage is present, and is practically non-existent in dense brown-top swards.

Field Daisy.

Daisy-invasion is invariably brought about by the running-out of the pasture owing to either the use of unsuitable species and unpersistent strains of grasses, or mismanagement, overstocking, and close grazing decreases the competition from pasture plants and favours the spread of the flat prostrate daisy growth. Unlike bidi-bidi, daisies seem to prefer damp, dark slopes. The use of good grass-mixtures and the practising of light grazing and spelling will result in a good dense sward which will prevent daisies from gaining a footing.

Ragwort.

The presence of ragwort is one of the problems of the Catlins district, for this weed is responsible not only for direct financial loss as a result of stock-mortality, but complicates farming procedure in a district that is largely dairying. With a limited area on most farms suitable for dairying it means that such areas must of necessity be reserved for dairy stock, and it is not possible for several months of each dairying season to utilize sheep for the control of ragwort.

Practically no effort has yet been made to control ragwort by means of spraying. The weed has a winter-dormant period which is not parallel with North Island experience, so that its aggressiveness is slightly reduced. This fact leads to a stock-management policy peculiar to the Catlins. In-lamb ewes are purchased in autumn, grazed during winter and early spring to check ragwort-growth and control spring development, and as the spring flush of feed appears ewes and lambs are sold all counted, and the herds of dairy cows utilize the subsequent feed. Sheep-grazing at present seems to afford the only effective and economical check to the growth and spread of ragwort, but the use of sheep is limited to a certain season of the year.

(To be continued.)

Rejected and Condemned Pigs.

Veterinarian Describes Reasons and Causes.

W. DONALD ROSS, Veterinarian, New Plymouth.

THE reasons for rejection or condemnation of pigs at freezing-works and bacon-factories have been given since the inception of the pig industry in New Zealand. The repetition seems to be well justified, however, as about 15 per cent. of all classes of pigs are rejected or condemned. If headless pigs were still unexportable the figure would be nearer 30 per cent. The exact percentage varies from district to district, but 15 per cent. is a conservative estimate.

The farmer, when his sheets return from the works, is confronted with a series of abbreviations, each indicating to him exactly why the pig or pigs in question were rejected or condemned and the weight of partly condemned pigs. Nearly all the firms and pig-marketing associations have adopted the same abbreviations, some of which are self-explanatory or are explained at the foot of the sheet, but in cases where the meaning is not exactly clear the companies are only too glad to elucidate.

It would be advantageous, where possible, for every pig breeder or vendor to come into the works to see his own pigs inspected and graded. The Meat Inspector will show him anything he wants to know regarding reasons for rejection, condemnation, or grading, and he will then be in a position to visualize exactly what is meant on his returns. For the benefit of those farmers who cannot follow their own pigs through I shall give as many of the abbreviations as are likely to crop up and parts condemned, &c.

T. or T.B.: Tuberculosis.

Tuberculosis is a chronic contagious disease, characterized by progressive emaciation. The symptoms, however, are as varied as the sites or organs in which the lesions are found, and many affected pigs show no evidence of the disease during life.

In this class 2 per cent. of pigs are wholly condemned for generalized tuberculosis and about 16 per cent. partly condemned, the majority of these being headless pigs—that is, pigs with the gland below the jaw, the submaxillary, affected. This may be a yellowish spot about the size of a pin's head or a lesion in which the whole gland is swollen to the size of a potato and sometimes full of pus. Headless pigs are exportable, subject to a rigorous check inspection of every accessible gland or organ. We generally find that 99 per cent. of affected pigs have head and throat lesions; bowels, 37 per cent.; liver, 31 per cent.; stomach, 17 per cent.; spleen, 16 per cent.; kidney, 1 per cent.; and backbone, 0·7 per cent.

Every pig is judged on its own merits, the lungs, liver, intestines, &c., being examined, and by various systems of tags and pins the final Inspector can weigh up all the evidence for and against and deal with it accordingly. On reaching Smithfield, these carcasses are subjected to a percentage examination as rigorous as our own, and it says a great deal for the New Zealand methods when we get few, if any, carcasses condemned in London.

The usual practice pursued by freezing companies is to deduct 10 per cent. of the carcass weight for a condemned head, and pay for this weight, say, 10 lb. to 18 lb., at a reduced rate. On an average it means a loss of 1s. to the farmer.

The commonest source of infection is raw skim-milk from tubercular cows. Contaminated pastures, tubercular poultry, infected pens, and tubercular sows all play their part, and can, by co-operation with the local Veterinarian or Stock Inspector, be eliminated to a great extent.

The loss to the pig-farmer in 1937 in reject price alone was £47,000. Reasons for the rejection or condemnation of pigs at freezing-works are given in this article, and the farmer will be able to judge whether his methods of management are perfect or otherwise when taken in conjunction with his works return.

P. or Pl.: Pleurisy.

Pleurisy is an inflammation of the smooth, glistening covering of the lungs and chest-wall, and is usually associated with pneumonia. About 5 per cent. of pigs reaching the works have at one time suffered from pleurisy to such an extent to reject them for export. Acute or active pleurisy, in which the animal is fevered, brings complete condemnation. Any fevered carcass, if passed for human consumption, might give rise to food-poisoning.

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In the majority of cases, however, the pleura is thickened and the lungs adhere to the chest-wall, indicating that the pig has had an attack and has recovered. These adhesions are carefully trimmed up and wiped and, if possible, removed. If, however, the pleura has to be "stripped" or is damaged or thickened the forequarter must be rejected.

If pus is present the carcass is condemned as a protection from food-poisoning.

If both sides of the carcass are affected the farmer is paid a reject price, meaning a loss to him of 10s. in a 120 lb. pig. If the pig has acute pleurisy or septic pleurisy and is condemned, but is in good condition otherwise, he may be compensated, depending on the general summing-up of the carcass.

Pleurisy heads the list of rejections with 5 per cent., all due to lowered vitality and the consequent invasion in the majority by the *Pasteurella* organisms at some time in the pig's life. Unbalanced rations, poor housing, dirt, unsheltered runs, &c., all lower vitality and increase susceptibility.

Pe. Pr. or Per: Peritonitis.

Peritonitis is inflammation of the peritoneum or smooth glistening membrane surrounding and enclosing all the organs and walls of the abdominal cavity. Thickening and adhesions are again present, and the membrane has to be "stripped." This automatically rejects the carcass. Practically 1 per cent. of pigs are rejected for this trouble.

Infection from faulty castration, migrations of internal parasites and consequent injury and contamination of the peritoneum, and the organism *Salmonella suipestifer* all lead to peritonitis. *Suipestifer* is characteristically a symptom of filthy conditions, poor housing, &c.

A. or Ab.: Abscess.

This is a closed cavity containing pus and found in any part of the carcass. The whole pig may have to be condemned or part condemned or rejected, according to the situation and degree.

Dirt, again, makes itself evident in conjunction with barbed wire, staggy pigs, protruding nails, broken glass, badly finished galvanized sheds, &c. Any infected and neglected cut or tear can give rise to an abscess or series of abscesses.

Ar. or Arth.: Arthritis.

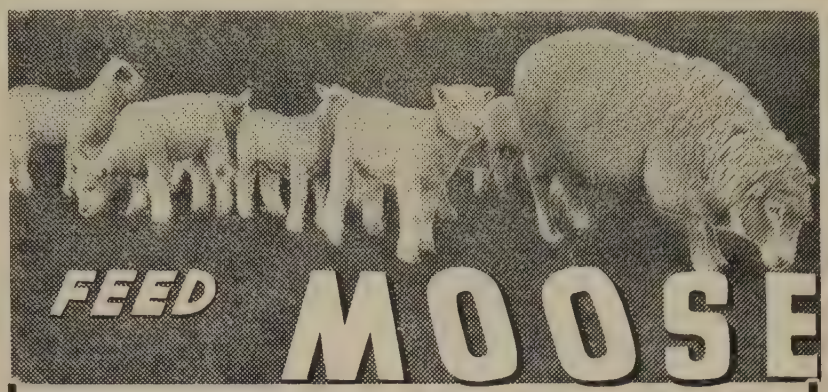
Arthritis is inflammation of a joint, the joint or joints usually being full of discoloured synovia (joint-oil) and swollen to a greater or lesser extent.

More hams are condemned or partly condemned for this condition than for anything else. Occasionally the pig is in poor condition with the joints of all four legs affected, when it is wholly condemned, the condition being called *Polyarthritis*.

Bruising, spraining down gratings, &c., the organism *Erysipelothrix rhusiopathiæ*, or mineral deficiency may be the cause, depending on the circumstances of each case.

F.C.: Faulty Castration.

Faulty castration is usually evidenced by a swelling at the site of the operation, these swellings being the swollen ends



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of the spermatic cords. Abscess and pus formation is all too frequent. These abscesses may extend into the abdominal cavity and give rise to varying degrees of peritonitis.

Again, the scar tissue may be the only seat of abscess formation. The swollen spermatic cords have to be cut out, thus spoiling the hams for freezing, apart from the fact that Smithfield will not accept them if badly cut into. If abscess formation is present the carcass may have to be condemned or partly condemned, according to the severity and spread through the body.

The site of the incision should be clean (washed with antiseptic and soap), the instruments clean and kept clean, and the pen or pasture clean when this operation is performed. No antiseptic on or in the wound is better than a harsh corrosive. The incision should not be too high up nor too small. Efficient drainage must be given, otherwise bacteria have an ideal site for propagation. The best time is when the pig is about three weeks old.

Sell as light porkers all pigs with retained testicle or testicles. The reason for this is given in the following paragraph.

S.O.: Sexual Odour.

Under this heading come pigs from which only one testicle has been removed and pigs with both testicles retained in the abdominal cavity, thus leaving the pig with all the characteristics of the boar. If the pig is not killed at the light-porker stage the odour of the boar rejects or condemns the pig when it comes to the baconer class. No matter how bacon, or ham from a "rig" pig is treated, boiling or frying will always bring the odour out in all its glory.

Cull boars, if castrated, fattened, and sent in as choppers, should be allowed at least two months from the time of the operation to eliminate the characteristic odour; otherwise they will be condemned.

S.D. or D.: Skin Disease.

Demodectic mange (rare), lice, and urticaria come into this class. The first two are obviously due to neglect of elementary treatment. Urticaria is a form of nettle-rash, as it were, in which the tender parts of the skin, belly, behind ears, crutch, &c., are reddened and inflamed. The pig is very liable to show digestive upsets on his skin, and as his pelt is left on the carcass it must be free from blemish. Thus, anything which will cause irritation and consequent scratching must be guarded against.

Waste car-oil floating on the surface of a dip or applied by hand every ten days will soon destroy lice. A sack soaked in car-oil and tied around a post which is accessible to the pigs provides scratch and cure in one. Urticaria, being due, in the main, to digestive upsets, unsuitable rations, &c., is of more obscure origin, and farmers should communicate with the local Veterinarian or Stock Inspector.

N. or Neph.: Nephritis.

Nephritis is inflammation of the kidney. This may be active and the pig fevered, in which case it is condemned. Usually the kidneys are pitted or scarred by a previous attack or by the migrations of internal parasites. The kidneys are removed and condemned, and if pus is present the whole carcass must be condemned. Cases of food-poisoning on the Continent and Britain have been traced to the consumption of meat from an animal with an abscess in the kidney. No risks can be taken.

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Suipestifer is the common organism found. Parasites in young porkers leave their mark on the kidney. Feeding and housing must be attended to, and foul skim pipes, decayed town offal, draughty dirty quarters, &c., must all be eliminated.

W. or B.: Wound or Bruise.

This term is self-explanatory.

Wounds.

Scar tissue may reject a part of a carcass because of unsightly puckering in the healing process. Septic wounds condemn part or whole of a carcass, depending again on the site and severity. Abscess formation, dealt with under that heading, may be present.

Scratches may become infected with the cutaneous *Spirochætes*, resulting in ulcerating nodular skin lesions of varying severity according to the length of time they have been neglected. We sometimes get pigs with necrotic patches 12 in. in diameter oozing evil-smelling pus. Scrubbing and dusting with tartar emetic at weekly intervals will clean up *Spirochætal necrosis*. Pointed objects, quarrelsome pigs, dog-bites, &c., as under "abscess," are the causes. The only sure cure is elimination of the attributing factors.

Bruises.

Bruises are usually caused by rough handling in trucking, kicking, and hitting with the first object at hand. A piece of wet canvas rolled up will act as an efficient coaxer and at the same time not bruise the pig. Overcrowding in narrow races or pens leads to pigs going down and being tramped on.

Bruises, if at all extensive, must be trimmed out, resulting in disfigurement of the carcass and consequent rejection in many cases.

Py.: Pyaemia.

The term pyaemia is applied when pus-producing organisms invade the blood stream from some suppurating focus, being carried all over the body and giving rise to multiple abscesses in the muscles, kidneys, liver, lungs, &c. All carcasses affected are wholly condemned. Septic wounds and abscesses usually supply the initial focus, and have been dealt with under these headings.

M.: Melanosis.

Melanin, a dark-brown pigment normally present in hair, skin, eyes, hooves, &c., may at times be secreted in excess by the body and be deposited in patches in the subcutaneous fat of the belly (seedy-cut), or it may invade the bloodstream and multiply in the form of tumours in any part of the body.

Emac. or E.: Emaciation.

A pig in a very poor condition, with absolutely no fat on it, the muscles even being wasted away, is said to be emaciated.

Natural thinness or leanness due to lack of sufficient nourishment must not be confused with emaciation, the general cause of which is some form of chronic disease. Emaciated pigs are wholly condemned.

Def.: Deformities.

Congenital deformities, curvature of the spine, &c., and rickets come under this heading. These carcasses are rejected. Only the bones are misshapen, and the meat is perfectly fit for food if the pig is in good condition otherwise. Congenital deformities cannot, of course, be foreseen or cured, but the pig should be eliminated as soon as it is noticed.

Rickets is a faulty nutritional disease of young pigs characterized by poor bone-formation, twisted limbs, knobby ribs, curved spine, poor teeth, &c. Vitamin D, found in green food, full milk, and cod-liver oil in conjunction with sunlight and bone-meal or bone-flour, will prevent young pigs becoming rickety.

Hydatids.

Hydatids is the cystic or intermediate stage of the *Taenia echinococcus*, a tapeworm of the dog. If badly affected, the whole carcass is condemned. The only way a pig can get hydatids is by ingesting eggs of the adult tapeworm, which is harboured by the dog. Food and water contaminated by infected dogs is therefore responsible. Care should be taken to treat all dogs on the farm for worms, and never to feed dogs with uncooked animal offal.

While on the subject of parasites it may be as well to mention the *Ascaris lumbricoides* or common round-worm of the pig. This worm, as part of its life-cycle, migrates from the intestine to the lung, in so doing injures the kidneys, liver, peritoneum, and pleura, and is therefore a constant cause of pneumonia, pleurisy, peritonitis, and nephritis.

If the worms are present in the herd the farmer should communicate at once with the local Veterinarian or Stock Inspector, who will advise treatment according to the circumstances.

W. or M.: Wet or Milky.

Cull sows sent into the works as choppers, if still in milk, have the mammary glands removed and are rejected. The cure is obvious.

Summary.

The listed series of reasons for rejection and condemnation are the most common. Occasionally, we have to reject or condemn for other causes not listed above, but they are of so small economical importance as not to merit mention, being only about 1 per cent.

It seems a great pity that New Zealand, which is virtually free from pig diseases apart from tuberculosis, should be losing money hand over fist through condemnation and rejections caused by mismanagement on the part of the farmer. Mismanagement may seem a hard term to use, but the fact that tuberculosis claims only 2 per cent. of a total 15 per cent. rejection seems to justify its use.

Loss to Farmer.

The New Zealand Official Year-Book gives the export figures (1937) for all classes of pig carcasses as 570,686 cwt., but this represents only 85 per cent. of what could have been exported, as 15 per cent., or 100,709 cwt., were rejected. The total export could have been 671,395 cwt. The loss to the pig-farmer in reject price alone on 100,709 cwt. is £47,000. That, of course, is only the beginning of the loss to the country.

Insurance schemes and Government compensation for condemned stock may overcome the difficulty for the bad farmer, but the man whose stock is clean is being penalized to nurse his less efficient neighbour.

If a farmer's pigs are being rejected he should communicate with the local Veterinarian or Stock Inspector and ask for his advice.

From the list I have given the farmer can judge whether his methods of management are perfect or otherwise when taken in conjunction with his works return, for, after all, it is a fairly accurate indication. A dead pig tells an unbiased tale.

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Government Official Herd-testing of Purebred Dairy Cows.

Summary of the 1937-38 Season's Work.

Contributed by the DAIRY DIVISION.

THE Government official herd-testing system continues to receive steady support, annual entries being maintained around the two thousand mark. For the year ended 30th September, 1938, tested cows numbered 2,184, an increase of 82 cows over the previous year's total of 2,102, while 20,978 statements of seasonal production have been issued since the start of the system eleven years ago—a yearly average of 1,907 cows. During the season under review cows were tested by 203 breeders, as compared with 207 breeders for the year ended 30th September, 1937.

The maximum number of certificate-of-record breeders testing cows during the season was 260, indicating that 78 per cent. of our testing breeders made entries in the Government official herd-test. The 20,978 statements issued represent 14,436 different cows, 6,568 of which have been tested more than once, while several have been tested eight times or more.

Average butterfat-production per cow was 329·13 lb., a decrease of 3·63 lb. over the previous year's average of 332·76 lb. butterfat. The average lactation period also declined by three days, being 279 days for the year under review.

The statistics appearing in this review are based on all cows on test for 180 days (six months) or more, the Government's official herd-test being a 305-day (ten months) test. In addition to the registered purebreds, 37 grade cows were tested by special arrangement, compared with 47 during the previous season. These, and 161 purebreds on test for less than 180 days, are not included in the tables.

For purposes of comparison the following figures relating to average butterfat-production for the various cow-testing systems in operation in the Dominion are given: The average of cows on group and association herd-test for the 1937–38 season, based on all cows in milk 100 days or more, was 257·55 lb. fat in 250 days. *On the same basis*, the Government official herd-test average was 322·33 lb. fat in 274 days, the certificate-of-record 305-day test average was 452·90 lb. fat in 302 days, and the certificate-of-record 365-day test average 512·68 lb. fat in 350 days.

It will be noted from the accompanying tables that no representatives of the Red Polls were under test last year.

Table 1.—Official Herd-testing in Past Two Seasons on Basis of all Cows on Test for 180 Days or more.

Breed.	Number of Breeders.	Number of Cows.	Average Yield for Season.		
			Days.	Milk.	Butterfat.
SEASON 1936–37.					
				Lb.	Lb.
Jersey	173	1,339	282	6,154·8	335·61
Friesian	24	425	286	9,611·1	342·48
Milking Shorthorn	6	98	266	7,085·7	285·39
Ayrshire	2	25	286	7,097·1	304·11
Red Poll	1	17	240	4,490·0	181·02
Shorthorn	*	*	*	*	*
Totals and averages	203†	1,904	282	6,971·7	332·76
SEASON 1937–38.					
Jersey	176	1,527	280	6,117·9	331·93
Friesian	20	362	276	9,050·2	323·86
Milking Shorthorn	6	58	271	6,489·9	273·88
Ayrshire	2	39	282	7,649·4	350·45
Red Poll	*	*	*	*	*
Guernsey	*	*	*	*	*
Shorthorn	*	*	*	*	*
Totals and averages	203†	1,986	279	6,693·3	329·13

* Not represented. † Totals do not agree, as one breeder tested more than one breed.

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Table 2.—Average Production in Classes and Breeds for all Official Herd-test Cows.

Class.	Season, 1936–37.				Season, 1937–38.			
	Number of Cows.	Average Days.	Average Milk.	Average Butterfat.	Number of Cows.	Average Days.	Average Milk.	Average Butterfat.
			Lb.	Lb.			Lb.	Lb.
Jersey.								
Two-year-old and under	574	283	5,500·5	300·36	585	280	5,475·6	297·79
Three years	266	280	6,198·9	342·10	331	278	6,149·0	334·89
Four years	179	285	6,855·2	371·24	229	285	6,597·2	360·30
Mature	320	280	6·899·9	373·49	382	280	6,787·2	364·65
Friesian.								
Two years and under	99	290	8,239·8	297·84	78	281	7,289·4	270·22
Three years	69	282	8,904·3	322·46	75	275	8,841·2	314·32
Four years	79	285	9,875·2	351·12	64	272	9,205·8	323·75
Mature	178	286	10,530·4	371·22	145	276	10,036·8	357·70
Milking Shorthorn.								
Two years and under	32	272	5,887·4	240·08	22	279	5,514·1	232·59
Three years	14	247	6,044·2	242·96	11	275	6,447·7	264·52
Four years	20	265	7,376·4	293·49	8	267	7,231·7	305·37
Mature	32	270	8,558·1	344·20	17	260	7,431·0	318·56
Ayrshire.								
Two years and under	10	296	5,891·0	244·89	10	271	5,885·0	271·58
Three years	1	268	6,314·1	255·02	6	293	7,423·1	330·79
Four years	2	235	5,582·2	246·06	4	301	9,266·5	430·81
Mature	12	287	8,420·0	367·23	19	281	8,309·0	381·24

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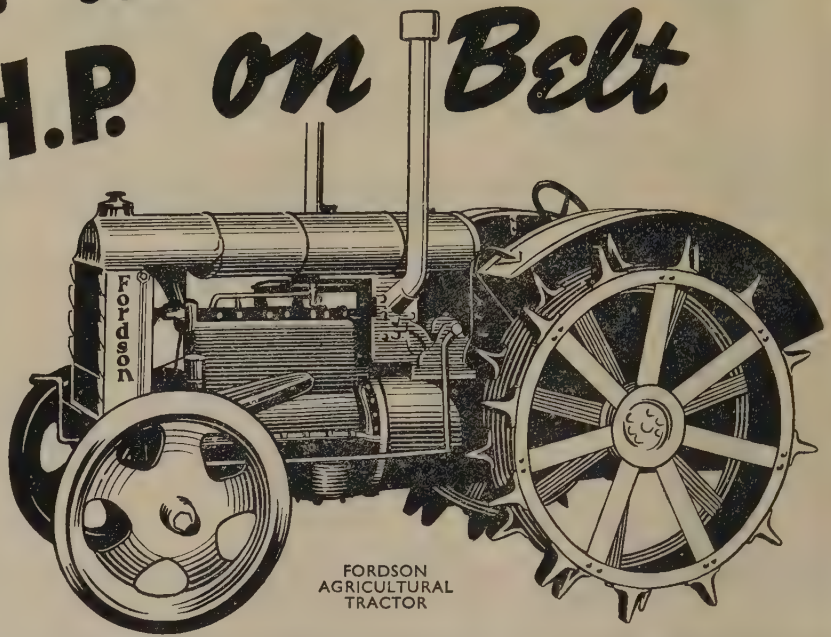

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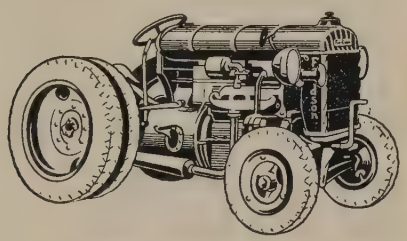

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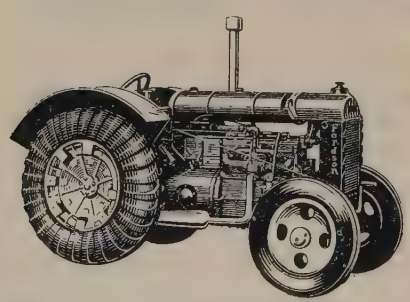

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Creating High-producing Pasture.

Proof of Superiority of Certified Strains of Seed.

D. M. E. MERRY, Instructor in Agriculture, Nelson.

IT is a well-known fact that just as there is variation in ability to produce among individual members of a herd, so, also, are there marked differences in production and persistency in various strains of grasses and clover. A good herd is built up only by careful selection and breeding; good high-producing pasture is obtained in similar manner. Each plant in every good pasture must, indeed, be a high potential producer.

Under the Government scheme of grass and clover seed certification good seed is now available to the farmer, although at slightly higher prices, of certified lines of proved persistency, high productivity and feeding capacity, and long growth-period. The accompanying series of photographs should amply illustrate the wisdom of sowing only certified seed; ordinary commercial lines are not of a high enough standard for the good farmer of to-day.

The Moutere clay-loam-soil type, which is of considerable extent in the Nelson District, is notably deficient in both lime and phosphate, while its reserves of organic matter are not infrequently low. The plots of various strains of grasses and clovers illustrated were sown by the Department of Agriculture on the property of Mr. C. A. Newport, Braeburn, in late February, 1937.

A pre-dressing of 1 ton of lime per acre had been applied, and 3 cwt. of superphosphate was broadcast at sowing. On this trial the superiority of certified strains of perennial rye-grass, white clover, and Montgomeryshire red clover is outstanding. The photographs were taken in early April, 1938, to illustrate these facts.

In Fig. 1 (*a*) the plot to left of photo was sown with a poor false perennial (commercial type) rye-grass. That to the right is a pedigree perennial rye-grass (Plant Research Station selection). Note the complete failure of the false perennial type after the first year, with white clover becoming dominant.

Note the failure in Fig. 1 (*b*) of poor false perennial (commercial type) on the left of the photo, compared with certified mother seed on the right.

Certified permanent-pasture rye-grass was sown on the plot to the left in Fig. 2 (*a*), while a false perennial (poor ordinary commercial) was sown on the right. Note the vigour of the certified pasture type.

Figure 2 (*b*) shows pasture establishment with certified strains. Good commercial strains were sown to the left of the photo, compared with certified strains to the right. Note the superiority of certified strains.

Figure 2 (*c*) shows the establishment of red clover. The plot to the left of the photo was sown with late-flowering

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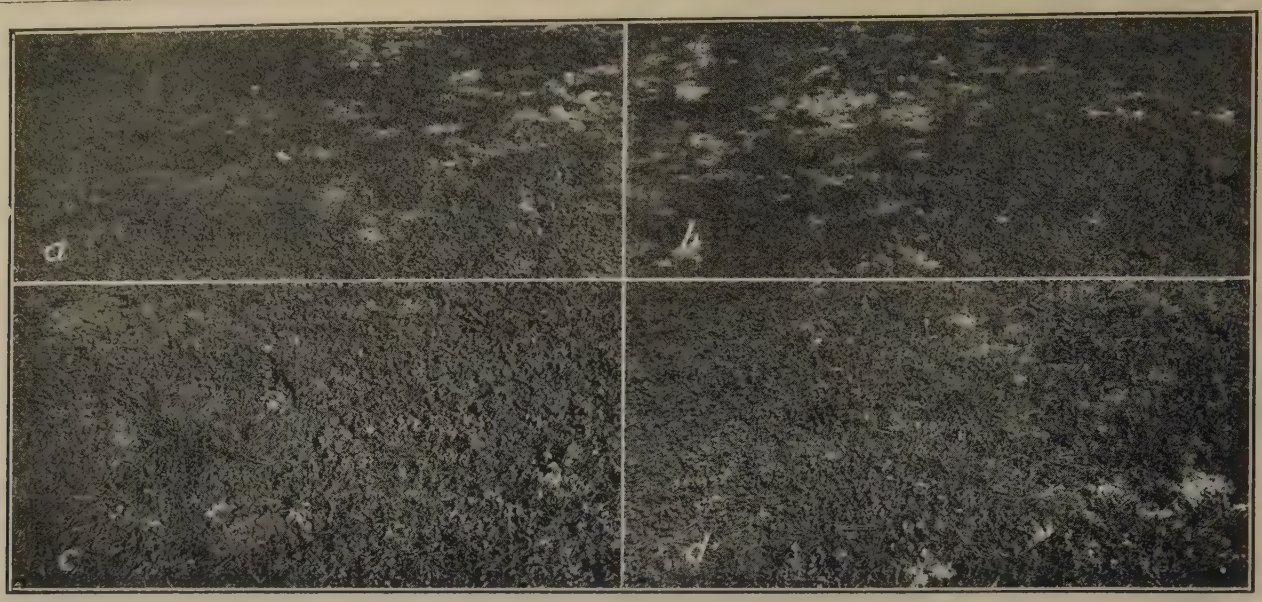

red clover, while to the right certified Montgomeryshire red clover was sown. Note the superiority of the certified Montgomeryshire type.

Figure 2 (*d*) shows the establishment of white clover. The plot to the left of the photo was sown with certified permanent-pasture white clover, while on the right a poor imported white clover was sown. Note the good establishment of certified permanent-pasture white clover to the left of the photo and the poor establishment of poor imported white clover at the right.

All comparable plots were sown at the same rates of seeding, and all plots of the series have received identical manurial treatment and subsequent management.

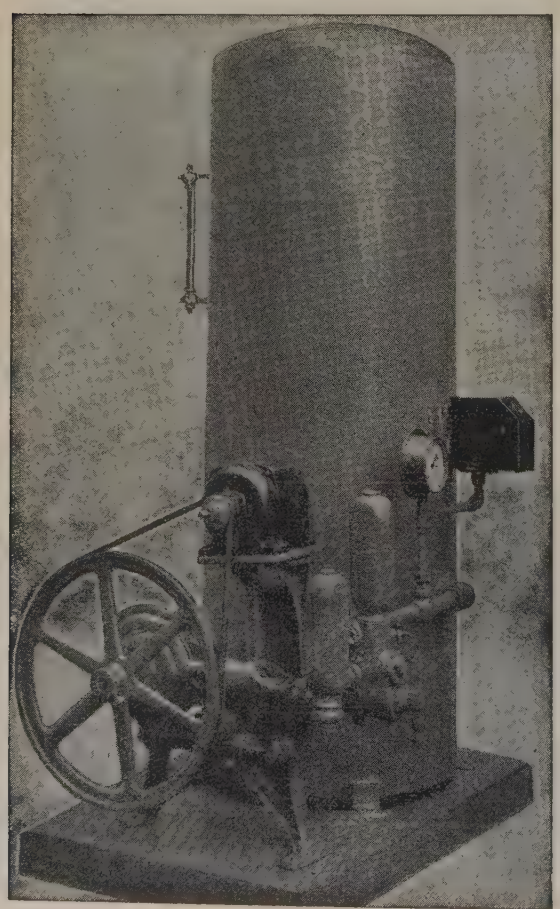

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Fig. 1.—Experts at work roguing an onion-seed crop.

Trials with Onion Seed.

Production of Improved Varieties under Departmental Supervision.

Contributed by the FIELDS DIVISION.

THE onion crop, although not of major importance by virtue of its acreage, is nevertheless productive of considerable revenue to many small holders where soil and climatic conditions are suitable for this crop. In a normal season the Dominion produces approximately two-thirds of the annual requirements, local growers supplying the market from January until August. In the spring months it is necessary to import onions, and when these are procured from California or British Columbia the landed cost is invariably high.

It frequently happens that when crops are heavy the market during the autumn months becomes oversupplied, with resultant loss to growers, particularly those who have only soft, poor-keeping varieties. A great deal of wastage then occurs until the glut disappears from the market and firmer prices are obtained, until at the close of the season the last of the local supplies bring comparatively high prices before importation is possible.

Reasonably remunerative prices to onion-growers may be maintained by regulation of supplies on the market, but this can be economically justified only if the bulk of the crop held in store or on the farm is not subject to a high degree of wastage.

The main problem facing the onion-growing industry in New Zealand is the production of onions of sound keeping quality so that marketing of the crop may be spread over a longer period and a glut of perishable produce avoided. The Department is now supervising the production of seed of the variety Pukekohe Long-keeper, which has definite claims to superiority, especially on account of its good keeping-quality.

Main Problem.

The main problem of the onion industry, therefore, appears to be the necessity of growing varieties of good-keeping quality which, at the same time, give high yields and are in other respects, such as disease resistance, suited to the special conditions under which the crop is produced in New Zealand.

It is frequently found that varieties of merit in overseas countries are commercially valueless, or nearly so, in this country, so that it has become the practice to produce seed in New Zealand from varieties which have been proved suitable. Another point is that imported seed is frequently of lower germination and the seedlings are lacking in vigour.

It has been the practice of many of the leading onion-growers to raise their own seed from selected bulbs. This has resulted in the development of a fairly wide range of types and strains, each one being claimed by its producer to have special points of superiority. In order that more information on the question may be obtained, the Department is now undertaking a series of trials, using a number of seed samples collected from commercial seed-raisers. As a result of these trials it is hoped that the best one or two strains may be selected out, and that sufficient information may be obtained to permit the introduction of a scheme of certification of onion-seed covering several of the best all-round strains.

However, it will probably take several years of work to attain the uniformity of type and purity of strain required before certification can be warranted. In the meantime, with a view to effecting

an immediate improvement in the onion-seed position, the Department last year undertook to supervise the production of seed of the variety "Pukekohe Long-keeper." A total of 850 lb. of seed from the 1937–38 harvest was given official recognition, while in the current season approximately 3 acres of onion bulbs are being grown in Marlborough under the supervision of departmental officers.

Pukekohe Long-keeper.

This variety has shown in trials previously conducted by the Department a very definite superiority, particularly in regard to keeping-quality. In 1937 a test was conducted by the Department in which small quantities of several varieties of onions were kept in close-mesh bags under ideal storage conditions. The onions were examined at fortnightly intervals and diseased and sprouted onions removed. At the end of October, while there were practically no sound bulbs of other varieties left, about 40 per cent. of the Pukekohe Long-keeper were still in perfectly sound marketable condition.

It will be recollected that the 1937 crop was a particularly poor-keeping one.

This variety is of high yielding-capacity, and the individual bulbs are large, though normally not so large as the Straw Spanish variety. They are also darker

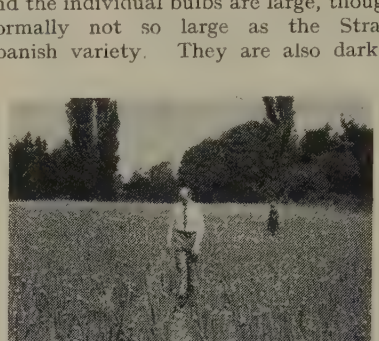

Fig. 2.—A crop of Pukekohe Long-keeper onions being grown for seed.

in colour and somewhat harder than the latter variety. The bulbs are globe-shaped, with attractive golden-brown skin; they are of good texture and of mild flavour.

Selection of Bulbs.

A line of bulbs from a crop of Pukekohe Long-keeper is hand-selected each year by officers of the Department, and is then passed over to a commercial firm for the production of a crop of seed. Special care is taken to have the bulbs planted on clean soil, and in a district well isolated from other onion-seed crops. The growing crop is inspected and "rogued" by experts, and the produce, after machine cleaning, is sealed in 1 lb. packets. This seed is not certified, as it is impossible, as yet, definitely to claim that the strain being grown is actually the best available of the variety. It can be said, however, that the seed is definitely that of the variety Pukekohe Long-keeper, which has claims to superiority, and that the seed has been produced under official supervision.

When it becomes possible to introduce certification of onion-seed the above system of approval will be replaced by the more complete system of certification, but in the meantime onion-growers can derive substantial advantage from knowing that there are now available supplies of seed of Pukekohe Long-keeper grown under departmental supervision.

A call to all!

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Removal of Surface Water.

Underground Drainage of a Field.

J. E. BELL, Instructor in Agriculture, Auckland.

THE wet weather experienced the last winter has turned the thoughts of many farmers to drainage. Areas which are rather wet in winter in normal years have been morasses this past season. Figure 1 shows an area which is dry and easily cultivated in the summer and which in normal winters shows a small pond of water, which this year has spread to the size of a lake. This is an area for which drainage will be well repaid.

Figures 2 and 3 show a drain which is being made to remove water from an area similar to that in Fig. 1. In both these areas the soil is light and drainage is easily accomplished, and is restricted to the draining away of natural ponds and wet hollows. Even hillsides need drainage in heavy soils, and will be wet over the winter. Particularly is this so where there are ironstone pans in the subsoil to prevent the natural flow of the water. On such areas rushes are often seen growing up even moderately steep hillsides.

Fig. 1.—A lake which would repay handsomely for drainage. All that is required is an outlet for the water through a small rise.

Underground Drainage.

Such areas require underground drainage. Different methods of underground drainage can be employed, and of these tile drainage is the most expensive and should not be lightly undertaken. Draining is usually carried out in the winter, for it is then that one can see more clearly the wet areas, and drainage can be arranged accordingly.

Before starting to tile drain a field the plan of the drains should be carefully worked out. An outlet must be found to an open drain, stream, or river which will carry off all the water likely to be discharged from the drains. Next, where hills adjoin level ground, an open drain should be dug around the foot of the hill to carry off all the soakage and surface water from the higher ground. An underground drain in this position is not nearly so efficient, as much of the water from the hills will run over it during periods of heavy rain.

Plan of the Drains.

The plan of the drains depends entirely on the topography of the field. The main line of tiles should follow the line of natural drainage where water collects. Generally, this is all that is necessary, but if the field still remains wet, lateral tile drains should be made connecting up with the main line of tiles. Lateral drains should enter the main drain at an acute angle so that the flow of water in the main drain will not be checked by the meeting of two opposing currents of water. Opposite laterals should not enter this drain at the same point; a few feet should always intervene.

Fig. 2.—A drain which is being constructed to take away water from a wet hollow on a farm.

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The limit of length of laterals should be 10 chains where the fall is poor and 15 chains where the fall is good. In draining a field one should always try to find the source of the wetness. The trouble is often caused by a spring or several springs. These springs should be located, and the water trapped by deep drains so that it cannot diffuse itself through the soil.

Suitable Depth.

The depth of drains varies from 2 ft. 6 in. to 4 ft. The average depth is about 3 ft. The main drains should be about 6 in. deeper than the laterals. The lateral drains should have a fall of 2 in. to 6 in. per 100 ft., a 3 in. to 4 in. fall being ideal. The grade of the drain is usually determined by watching the flow of the water.

The lines of drains are sometimes struck out with a plough, and the furrow slice graded back. If possible, a second and third furrow slice is taken out and graded back. The rest of the drain is made with a draining-spade, the work commencing at the outlet. The drain is dug 18 in. to 20 in. wide at the top, and 8 in. to 10 in. wide at the bottom. The tiles are often laid in a groove made in the bottom of the drain with a special goose-necked scoop. If such an implement is not available, a narrow-mouthed shovel will make a hollow for the tile.

The tiles should be laid from the outlet. If there should be any hollows in the bottom of the drain it is unwise to fill them with loose earth. Make a track for the tile in firm ground in the side of the drain. If a soft patch of ground is encountered, the tiles should be carried over this on boards. In laying the tiles, twist them around so that the edges meet at the top, and if they are inclined to roll, pack earth alongside so that they are kept in position. Place an inverted turf over the joints. Ordinary farm tiles should not be laid near trees, because roots are liable to enter the joints. For lateral drains 3 in. tiles are satisfactory, but sometimes the upper half is laid with 2½ in. tiles for long drains.

Fig. 3.—A close-up of a drain. The gentle flow of the water is the best guide as to the fall. Tiles are being laid, and are being followed by filling in.

Measurements of Main.

Under ordinary conditions a 4 in. main will drain 4 acres to 5 acres of land, a 6 in. main 6 acres to 8 acres, and an 8 in. main 12 acres to 18 acres. Special tiles with junctions on them can be purchased, but these are costly, and, because of their uneven shape, are often broken in transport. Laterals are often jointed to the main tile by making a hole in the main tile and fitting the lateral into it. This is done by making a small hole in the main tile with a sharp-pointed hammer or a cold chisel and gradually enlarging the hole until it is the correct size. The end of the lateral pipe is chipped to fit the inside of the main.

The outlets should be observed occasionally and growth cleared away, and they should also be protected from access of vermin.

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ALL BRANCHES THROUGHOUT NEW ZEALAND

Control of Weeds by Insects.

Effect on Blackberry, Ragwort, and Piripiri.

DR. D. MILLER, Cawthron Institute, Nelson.

AS many inquiries are reaching us this season regarding insects already attacking blackberry, ragwort, and piripiri, and also with reference to our researches upon the insects imported by the Cawthron Institute for the control of these weeds, the following statement will interest farmers in all parts of the country.

Possibilities for the control of such noxious weeds as blackberry, ragwort, and piripiri by insects are discussed fully in this article. It is emphasized, however, that the control of weeds depends mainly on pasture management, and that in most cases insects must be regarded merely as auxiliaries to farm management.

Blackberry.

With regard to blackberry, almost every mail lately has brought specimens of the common bronze beetle for identification. It appears that this insect is particularly active this season in its depredations upon the foliage of blackberry, raspberry, strawberry, and ornamental and fruit trees. The beetle is a small, shining, brown hard-bodied insect that has a characteristic habit of leaping when disturbed on the plant. Its method of attack is to eat holes from the leaf surface, so that in severe cases the foliage appears to have been punctured by a charge of shot.

The hopes held by correspondents that this is a remedy for the blackberry problem have, unfortunately, no foundation. The beetle may at times visibly check the weed, but its period of activity is limited to a few weeks each year, and it is not always constant in the severity of its attacks. Further, it could hardly be encouraged because of its depredations upon plants of agricultural value.

Our attempt to control blackberry by means of important insects had to be given up, as there was too great a danger of related plants of economic value being attacked. Practically the whole world was combed for insects restricted to blackberry, but the only one that was considered worth trying had to be finally abandoned. The reason for this was mainly due to the fact that although the insect's grub confined itself to boring in the stems of blackberry, the adult insect showed a decided trend as a defoliator of apple-trees.

Ragwort.

This season a great deal of attention has been drawn to the attacks upon ragwort of a small leaf-mining fly, and it would appear that this insect is causing a considerable amount of havoc with the weed. The grubs of the fly are commonly found tunnelling in the leaves of ragwort, cineraria, and sow-thistle, but during the present season the insect has reached epidemic force. Normally it is of little importance and is heavily parasitized by a natural enemy.

Ragwort is also frequently attacked in New Zealand by stem-boring grubs of another species of fly as well as by the caterpillars of a moth, but, like the leaf-miner, it is only intermittently that they are able to reach a sufficient force to cause a noticeable check to the weed.

In the control of ragwort our researches at the Cawthron Institute have been concerned with two insects—the cinnabar-moth and the ragwort-seed fly. The caterpillars of the moth are defoliators, but although we succeeded in establishing the insect it was unable to hold its own in most parts of the country. This was due, to a great extent, to the attacks of birds and insect parasites upon the caterpillars; the insect parasites were those that commonly attack the native woolly-bear caterpillars, which is a relative of the cinnabar-moth.

In any case, the cinnabar-moth would have had a limited influence upon the weed, as its caterpillars are active for only a few weeks before the close of each year. It is of interest to note, however, that Mr. Fitzgerald, Engineer to the Matamata County Council, has reported

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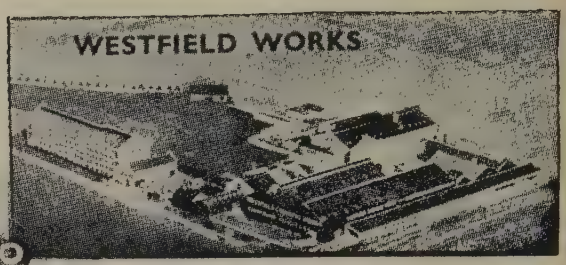

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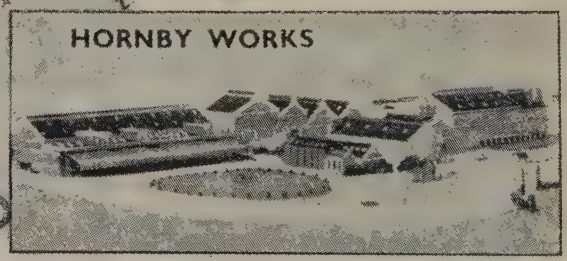

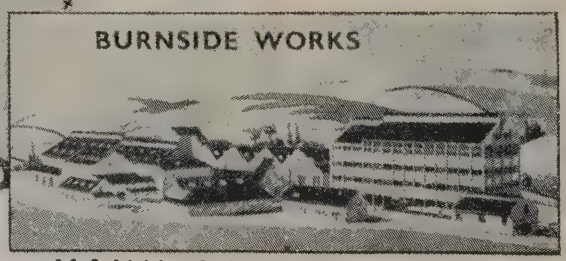

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the establishment of the cinnabar-moth in one locality on the Waikato River during the last two or three years.

In the case of the ragwort-seed fly, work is being carried on at the present time with this insect, and we are making satisfactory progress. Although the prospects are hopeful, I must stress that we are not yet in a position to state that the insect will be a success. It must always be borne in mind that, even if successful, this fly in the maggot stage attacks only the seeds of ragwort and must not be depended upon to clear up the weeds on land accessible to farm management. The most that can be expected of the fly is that it will check the seeding and spread of the weed from neglected localities.

We are not yet ready to make general liberations of the seed-fly, but when our field observations show that the insect is of value under New Zealand field conditions we shall give consideration to an extensive campaign of establishment.

Piripiri.

Piripiri (or bidi-bidi) is another of our major weed problems. The only native insect attacking it to any marked extent is a species of mealy bug that infests the roots, but, like the bronze beetle of blackberry or the leaf-miner and stem-borers of ragwort, it is only occasionally that this mealy bug markedly checks the weed.

Our main activity in control of piripiri is by means of the Chilean saw-fly, upon which we have been working for some time. Field liberations have already been made, but it is too soon to expect anything definite. On selected areas (in Taranaki and Poverty Bay) the insect is being concentrated in order to build up a sufficient population under field conditions from which we shall be in a position to decide whether or not general establishment should be undertaken. For the time being no supplies can be distributed to farmers.

Under experimental conditions in New Zealand and from observations made in Chile this saw-fly has considerable powers of control, but when the first liberations of the insect were made in the Dominion circumstances demanded that the supplies be freed in small numbers in many places instead of being concentrated. This has led interested farmers to be rather disappointed, in that conspicuous results are not yet discernible.

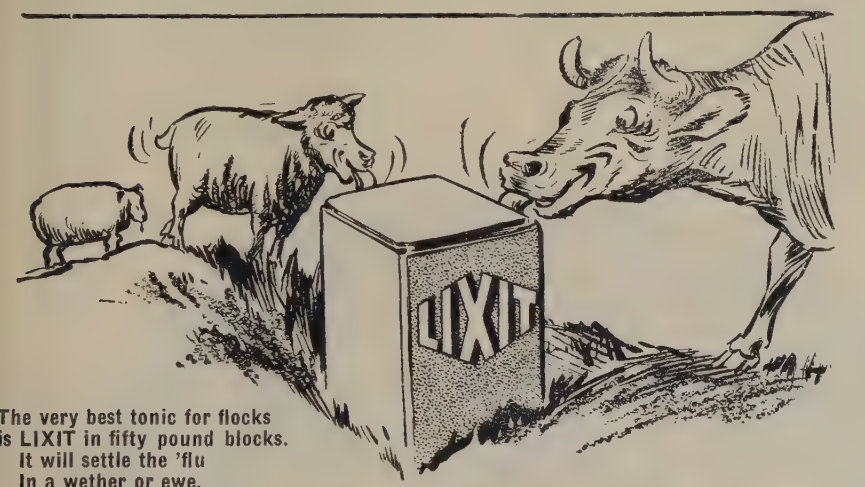
It should be remembered, however, that although the saw-fly is a slow breeder when compared with other insects the piripiri is virtually a fixed unit, and that the insect requires time to breed up its population to a point where its influence upon the weed will be noticeable. The available data encourage one in the opinion that there are considerable possibilities of the saw-fly reaching this state, but progress will be slow. The work of field establishment cannot be hurried beyond importing, rearing, and liberating the insect in countless numbers. Apart from this, the matter lies with the insect itself and with its environment.

Conclusion.

The control of weeds depends mainly in pasture management, but there are circumstances where this method is not altogether practicable, so that additional methods, such as the use of insects, have been sought. In the expectation of results from insects, however, there is a tendency for optimism to get the better of reason in the case of many people whose livelihood is threatened by the invasion of weeds. This outlook is well understood by any one who is alive to the seriousness of the situation and of the losses that many farmers sustain.

But it cannot be too often stressed—even in the face of such an outstanding success as has been attained in the control of prickly-pear in Australia—that in most cases insects must be looked upon merely as auxiliaries to farm management in weed control. Again, on the liberation of an insect, immediate beneficial results must not be expected; control may be rapid, it may be slow, or it may be not at all. There are so many factors operating in the field concerning which we know nothing, all or any one of which may be detrimental or beneficial to the establishment and effectiveness of an insect once it is liberated.

On the other hand, the information derived from our researches in New Zealand and from observations elsewhere tells us of the possibilities of successful control by insects. In consequence, the experiment is worthy of trial in view of its small cost in comparison with what is at stake and the sums annually spent upon the suppression of weeds in other ways.



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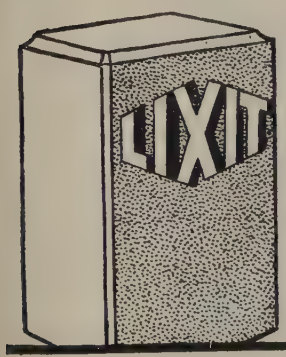

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Testing New Varieties of Maize.

Trials at Ruakura Farm Training College.

P. S. SYME, Instructor in Agriculture, Warkworth.

ALTHOUGH science has done much to reduce the element of luck associated with the growing of bumper crops, chance in the form of a favourable or an adverse season still provides a major hazard. This applies even where the crop grown is one so well adapted to normal climatic conditions as to be generally incorporated in the crop rotation, as is exemplified by the recent glut of potatoes and by the wide fluctuations frequently observed in the yields of wheat—both staple crops of the South Island farmer.

When a crop is grown beyond its natural climatic range the hazard becomes still greater, and the limitations of the varieties which are available may restrict their economic production to very narrow geographic limits. This applies with particular force to maize as a New Zealand crop, and it is for this reason that special interest attaches to the quest for early-maturing varieties capable of extending the crop's range.

Effect of Climate.

The climate of the Waikato district is by no means ideal for maize, and it is not surprising to find that the yields obtained in the variety trials conducted at the Ruakura Farm Training College during the past four seasons have reacted strongly to the weather conditions. A uniform system of management has been adopted throughout the period, and, while the differences in the soil fertility and in seeds used may have been to some extent responsible, there can be little doubt that the higher yields obtained during 1937–38 have been mainly due to an exceptionally favourable season.

The following is a comparison of yields per acre during the past four seasons :—

Variety.	1934–35.	1935–36.	1936–37.	1937–38.
	Bushels.	Bushels.	Bushels.	Bushels.
Ninety Day	67·0	55·0	..	..
Hickory King	61·0	51·2	62·0	..
Early Morn	..	93·6	..	..
Ryde's Excelsior	..	68·8	63·5	..
Golden Glow	..	62·8	..	50·2
Early Butler Cross ..	..	57·6	..	..
Early Butler	..	56·3	70·5	94·2
Otumoetai Horsetooth ..	..	..	..	98·3
Wellingrove	..	..	61·4	96·0
Kean's Rough Dent ..	..	..	59·0	90·3
American Early	..	..	39·7	63·3
Funk's Yellow Dent ..	..	..	..	96·0
Iowa Silvermine	..	..	..	116·4
No. 350	..	..	..	74·4
No. 450	..	..	..	63·3
No. 525	..	..	..	83·7
No. 680	..	..	..	107·6
Average ..	64·0	62·5	59·3	86·14

Students examining maize varieties at the Ruakura Farm Training College. [*A. C. Poole, photo.*

The above figures are of especial interest when considered in conjunction with meteorological data covering the four seasons under review.

Rainfall.

The rainfall during the 1937–38 season was well below normal. The driest period, however, in March, occurred when the plants were well rooted, and the effects of high temperatures with consequent high evaporation were less severe. This is in contrast to the period of low rainfall during the 1934–35 season, when, in spite of regular intercultivation, the crop suffered to some extent from lack of moisture. It is evident, however, that maize as a crop withstands drought well, and probably suffered more from the excess of rain in the 1935–36 and 1936–37 seasons than from lack of rain during 1934–35 and 1937–38.

Temperature.

This appears to be a factor of considerable importance, and the rapid establishment and growth through December and January of the past season was in very noticeable contrast with that shown throughout these months during the previous year.

Warm day-temperatures are essential for rapid vegetative growth and for setting of the grain, and very low temperatures may prove extremely harmful, particularly at certain stages of growth. Throughout t e growing seasons of the past four years, frosts were recorded only during November and April. There can be little doubt that of these two months, November is the more critical, as it is then that the plants are most susceptible to damage by frost. Observations made during the growing period showed that the earlier varieties were already approaching maturity by the 7th April, and had already passed the dangerous stage.

The fact that frosts were recorded in three out of the four Aprils and two of the Novembers under review suggest that for Waikato conditions the element of risk in growing maize would be greatly reduced if earliness of maturity could be combined with a relatively high yielding-capacity. That these factors are not invariably incompatible is shown by the following results of the past season :—

Variety.	Yield.	Order of Ripening.
	Bushels.	
Iowa Silvermine	116·4	12
No. 680	107·6	4
Otumoetai Horsetooth	98·3	8
Wellingrove	96·0	9
Funk's Yellow Dent	96·0	10
Early Butler	94·2	6
Kean's Rough Dent	90·3	11
No. 525	83·7	1
No. 350	74·4	3
No. 450	63·3	2
American Early	63·3	7
Golden Glow	50·2	5

It will be seen from the table that the heaviest yielder, Iowa Silvermine, is also the latest to reach maturity, while the first, second, and third in order of maturity are placed eighth, tenth, and ninth respectively in order of yield. The variety No. 680, however, appears to combine earliness of maturity with high production in a marked degree; it is also a robust grower and does not readily lodge. Judged by its performance, this variety offers excellent prospects of enabling the maize crop to be profitably grown over a greatly increased area of the North Island, but further tests will yet be necessary before its value can be properly assessed.

The variety Golden Glow established well, but was attacked by *Fusarium maniliforme*, and this considerably reduced the yield. Early Butler, the sixth in order of yield, is also sixth in order of maturity, and, judging from the past season, this variety should be reasonably safe from the risk of early frost, as the cobs were maturing and the grain moderately hard by the 7th April. Otumoetai Horsetooth and Wellingrove are both good grain-producers, and both produce a considerable bulk of green feed. These varieties are rather late in maturing, however, and it remains to be seen whether, over a period of years, their relatively high production will compensate for their somewhat greater susceptibility to damage by frost.

Farmers' Field Competitions.

North Taranaki District.

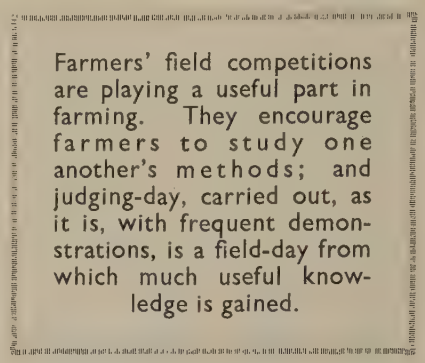
A. G. ELLIOTT, Instructor in Agriculture, New Plymouth.

CONTINUED success has attended the efforts of the competitions committee in the season just completed. The number of entries showed an increase over the previous year, and another encouraging feature was the interest shown by competitors, particularly in regard to the lower-producing swards in the improvement class. Of the total 572 entries judged, 445 were in the Dairy Class, 127 in the Open, and 280 in the improvement section. Considering the difficulties of pasture management during that period it is very encouraging to see that 162 entries were allotted equal or higher points than last year.

Value of Paspalum.

Warm, moist conditions from December to February, followed by low rainfall and high temperatures in March, resulted in a marked increase in spread on to new districts of both paspalum and ratstail, while the common weeds and weed grasses also made prolific growth. The value of paspalum, a species specially mentioned in this report of last year, has been amply demonstrated in a season such as the one under review, and under good management it has been outstanding for production generally, while maintaining a dense sward sufficient not only to repel invasion by inferior species, but also to provide a pasture less prone to poaching in winter. In the coastal districts, and particularly where sheltered from cold winds, this species in combination with rye-grass, dogstail, and in some areas prairie also, and the clovers, this type of mixed pasture has been brought to a state of high productivity.

Even under colder and less favourable conditions the grass has been satisfactorily introduced, as even where its season of high leaf-production is short, the value of the species in forming a dense turf to eliminate undesirable elements is becoming more obvious. It should be clearly understood, however, that the inclusion of paspalum in the seed-mixture will increase the need for better management based on closer observation of the sward constituents, so that no one species will be too closely grazed and ultimately reduced to permit dominance by others.


Farmers' field competitions are playing a useful part in farming. They encourage farmers to study one another's methods; and judging-day, carried out, as it is, with frequent demonstrations, is a field-day from which much useful knowledge is gained.

Ratstail also extended, especially to inland districts, and the problem of its eradication has become serious on many farms. Since the spread of this species is related to grazing management and raising of soil fertility by top-dressing and animal droppings experience to date indicates the economy of fencing off badly infested areas, especially where these are hill faces unpractical to plough.

Intensive grazing and spelling either by sheep or dry stock, and the prevention of seeding, gradually reduces the rank unpalatable growth of this grass, a process accelerated by the introduction and stimulation of clovers and naturally followed by better pasture elements. On easier country which is not yet dominantly ratstail, top-dressing, good grazing management, and prevention of seeding, will gradually reduce this undesirable species, and there are cases where shed washings or dried shed sweepings have increased the rate of improvement.

Farmers are slowly realizing that the species present in the sward are of major importance in the response from top-dressing, and the acreage improved by surface sowing is rapidly increasing. This, of course, is merely a short-cut method in pasture improvement, but its adoption is becoming more general owing to two factors :—

Firstly, the almost complete failure of root crops during the last two years due to weather conditions, pests, and diseases, has resulted in a greater reliance on

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pastures and pasture products, and consequently the acreage ploughed is decreasing.

Secondly, the problem of weed-control after crops is becoming annually more difficult to cope with, and in this connection Californian thistle is a source of trouble throughout the whole territory. Since pastures cannot be economically sown down after cropping, the introduction of valuable constituents on to the old sward after heavy harrowing has become more general, the results depending largely on weather conditions during the operation, and later management of the treated area.

Top-dressing Practice.

Top-dressing practice has not shown marked change, but there is a gradual tendency to vary from the one application of a slow-acting fertilizer to two or more dressings of either a farmer's own or a proprietary mixture. These are of the usual type containing superphosphate, lime, one of the insoluble phosphates, and 30-per-cent. potash, and, while it is admitted that many local swards have been built up by the annual autumn applications of basic slag and similar fertilizers, the present practice indicates a real advance in knowledge of grassland farming.

It is becoming increasingly evident that once a pasture is well established farmers realize the value of more frequent top-dressing to provide feed over a longer period than was formerly considered possible. The importance of shelter is also being more fully realized, and the higher per-acre production from well-sheltered farms, where pastures are more vigorous and earlier in growth and stock are in better condition, amply proves the value of trees and hedges.

Drastic Harrowing.

Harrowing of pastures roughly falls into two classes—firstly, and of generally major importance, the use of a light draught implement for the spread of droppings and, secondly, drastic harrowing to remove certain weeds and weed grasses and prepare a seed-bed for surface sowing. Implements of an intermediate type for use where such weeds as blackberry and gorse are encountered are employed in districts so infested, but the most encouraging feature is the gradual appreciation of the fact that, except on tight sod-bound swards, of which really few are encountered, the drastic harrow is of doubtful value unless its use precedes the introduction of useful species.

Spring judging of entries commenced on 4th October and was completed on 26th November, field-days being held in a number of districts. Where younger farmers attended it was particularly encouraging to see them participate by allotting points on their own, the discussion on each field following inspection being of particular value. The thirty-three leading swards were inspected on 1st and 2nd February, and autumn judging with field-days extended from 7th March to 29th April. Final pointing of the swards revisited in summer was made on 27th and 28th June, and the awards were made as already mentioned on the aggregate of four judgings of entries in the dairy and open class.

Dairy Class.

The North Taranaki championship and I.C.I. Cup was won by Mr. W. J. Freeth, Urenui, with an area of 7 acres, four years old. This entry is a splendid example of a well-controlled, balanced sward containing paspalum, rye-grass, dogstail, prairie, and white clover, and pointed particularly well on the first three inspections. The field was top-dressed in 1936 and 1937 with 3 cwt. superphosphate per acre, and this year received a mixture of 3 cwt. lime, 3 cwt. superphosphate, and 2 cwt. 30-per-cent. potash.

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Second place was secured by Mr. J. J. Carey, Okato, whose 5-acre field was six years old, and dominantly rye-grass, timothy, dogstail, with white clover forming a vigorous, even sward. It has been top-dressed each year with a mixture of superphosphate and basic slag at the rate of 3 cwt. per acre, and showed evidence of good management and utilization, little variation being evident at each inspection.

Equal points for third place were secured by entries from Messrs. J. H. Paulger and J. L. Purdie, Tikorangi, and J. N. Blyde and J. Cloke, Lepperton. The swards on each of these farms showed the value of shelter and good management, while the high butterfat per-acre production secured demonstrates the high standard of utilization achieved.

Open or Mixed Grazing Class.

The Championship Cup was won by Mr. R. Cassie, Okato, whose area of ten acres, seven years old, was dominantly rye-grass, dogstail, and white clover, providing a vigorous dense sward. In view of its height above sea-level and exposure to cold winds, the pasture was in a remarkably good condition. It had been top-dressed with 3 cwt. per acre Phosful each year until the present season, when 1 cwt. superphosphate was added to the above. Grazing management and utilization by sheep and dry stock were uniformly good throughout the period under review.

Second place, by a narrow margin, was secured by the Piri Piri Estate, Awakino, with an area of 4 acres over twenty years old of river flat. The sward is rye-grass, dogstail, timothy, and white clover, generally dense and vigorous, grazed by sheep and dry stock. It was top-dressed in 1936 with 5 cwt. per acre lime, in 1937 it received 3 cwt. superphosphate, while this year 10 cwt. lime and 3 cwt. superphosphate were applied.

Mr. A. Wood, Omata, annexed third position, only half a point separating his entry from that at Awakino, his area of 6 acres being over twenty years old. Good management was obvious here, as shown by the small variation at each inspection, and the vigour and denseness of the sward under intensive sheep and cattle grazing were obvious. In 1936 it received 3 cwt. per acre basic slag and next year a mixture of lime, superphosphate, and 30 per cent. potash, at the same rate, while last season it was top-dressed with 3 cwt. basic slag and 5 cwt. lime per acre.

Messrs. J. Cloke, Lepperton, and H. A. Foreman, Tikorangi, were equal fourth place with well managed swards, the former grazed by pigs and the latter by sheep. Vigour and denseness were obvious in both these entries, the former particularly showing little variation throughout the season.

Improvement Class.

In the majority of cases the improvement in swards indicated by the difference in points allotted during the two years of judging has not been due to increased expenditure on top-dressing, but has been brought about as a result of improved management and utilization based on a more keen observation of the

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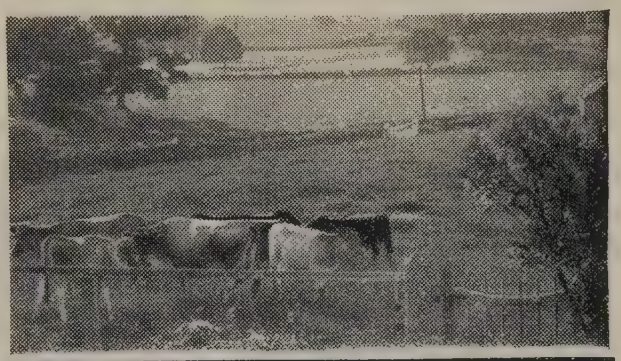

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sward constituents during the various seasons. The difficulties of management, particularly this year, have been mentioned, and consequently improvement in pastures generally under the trying conditions which obtained is really a credit to all those competitors whose entries secured the same or better points this year.

Some factors operating in improvement are, firstly, the rotating of harvest fields obviating the weakening of swards by consistent cutting, increasing the proportion of valuable constituents by surface sowing after harrowing, and the application of shed washings or dried sweepings. Greater appreciation of the value of rotational grazing, especially where weeds and weed grasses are becoming dominant, has also played an important part in improved pastures followed generally by increased production and higher return from top-dressing applied at various times of the year.

Championship Cup.

The Championship Cup in this section, in which both dairy and open or mixed grazing entries are eligible, was won by Mr. L. M. Penwarden, Omata, with a field of 8 acres over thirty years old. It had become weak in good grasses and clovers, due partly to late cutting for hay, and has been considerably improved by applications of basic slag 3 cwt. to 4 cwt. each season for the past three years, after the last cut for hay in 1936. Good grazing management has now resulted in a generally more dense and vigorous sward, and in future the applications of fertilizer and mixtures will be more than once each season.

Three competitors — Messrs. J. A. Budden and R. W. Giddy, Huirangi, and R. Phillips, Inglewood—secured equal points for second in this class, and in each instance the improvement has been due to improved grazing and methods of management.

South Taranaki District.

Contributed by the FIELDS DIVISION.

TARANAKI farmers have done valuable work in pioneering farmers' field competitions, first by way of root-crop competitions, next with hay and silage, and more recently by extending the competitions to include the most important source of animal feed—the pastures themselves.

The value placed on pasture competitions by the farming community of Taranaki as a means of comparing

Mr. Hugh D. Lambie, Mangatoki, who was placed in the dairy pasture classes.

methods and results in pasture establishment, in pasture-management (including top-dressing, harrowing, topping, and grazing), and in pasture utilization is illustrated by the rapid increase in entries and, therefore, in the number of farmers taking part in the discussions provided during the judging. The pasture competitions began in North Taranaki in 1934 with 115 entries, increasing to 449 in 1937, and to well over 500 this year. In South Taranaki there were 56 entries the first year and an increase to 160 for the year under review.

Instructive Field-days.

In South Taranaki pasture entries are judged by the Instructor in Agriculture in the spring and again in the autumn. The final judging of the leading pastures in each of the two classes is made a general field-day, when large numbers turn out to what amounts to a thorough inspection of the best pastures of the district.

The competitions are conducted by the Farmers' Union, but entries are not in any way restricted to union members. As it is a dairying district, the main class with 134 entries was for pastures grazed by dairy stock only. A second class for pastures in which mixed grazing is practised attracted 26 entries.

The schedule of points used in judging is as follows: (*a*) Good grasses, 25; (*b*) clovers, 20; (*c*) inferior grasses, 5—50 points for sward composition; (*d*) density, 10; (*e*) evenness, 10; (*f*) vigour, 10; (*g*) freedom from weeds, 10; (*h*) general management, 10—50 points for management and utilization.

Competition Results.

Dairy Class (134 entries).

K. W. Jackson, Ngaere, 174½ points, 1.
H. D. Lambie, Mangatoki, 174 points, 2.
J. Mitchell, Manaia, 173½ points, 3.

The Winning Pastures.

The winning pasture comprised 3 acres more than fourteen years old, autumn-sown, and top-dressed regularly for many years. For the last two seasons it was top-dressed with basic slag at 2½ cwt. per acre plus 1½ cwt. 30-per-cent. potash. An additional 2 cwt. of superphosphate was applied last December, and the pasture was twice harrowed during the season, regularly grazed, and topped once.

The second pasture comprised 8 acres over more than twenty years old, which was limed three years ago. Top-dressing for the past two years consisted of 2½ cwt. of basic slag and 1½ cwt. sulphate of ammonia in 1936, and 2 cwt. superphosphate and 1 cwt. 30-per-cent. potash

Mr. J. Mitchell, Manaia, who gained places in both the dairy and mixed pasture classes.

in 1937. It was cut for silage in 1936 and topped twice during the past summer.

The third pasture of 7 acres was eight years old, an autumn-sown pasture, and well manured since establishment. It was limed some years ago, and is annually top-dressed with 3 cwt. of superphosphate. It was harrowed twice and regularly grazed until closed for an early cut of silage this season.

Mixed Grazing Class (26 entries).

A. L. Bremner, Pukengahu, 181 points, 1.
G. R. Smith, Kaponga, 177 points, 2.
J. Mitchell, Manaia, 175½ points, 3.

The Winning Pastures.

The winning pasture comprised an area of 8 acres, seven years old, and autumn-sown with 45 lb. of seed. It was top-dressed annually, using a proprietary mixture, for the past four years at 3 cwt. per acre. It was regularly grazed with sheep and cattle, and was never mown or topped.

The second pasture was of 17 acres, six years old, and spring-sown with 57 lb. per acre. It was annually top-dressed with 2½ cwt. per acre of basic slag, and was limed in 1937. It was constantly grazed by sheep and cattle. There was no topping, but the pasture was harrowed once in past season.

The third pasture's area was 5 acres, and it was twelve years old and was cut for silage in 1935. No topping was done, but it was harrowed twice. A top-dressing of 3 cwt. superphosphate was applied annually with 1 cwt. 30-per-cent. potash in 1937. The land was limed some years ago.

Comments on the Competition.

It may be argued that for competition purposes individual paddocks representing a small area of the farm may be subjected to special treatment in an endeavour to have the selected paddock looking its best for judging. This possibility is provided for in several ways. First, winning pastures are not again eligible for a stipulated period; secondly, the actual day of judging is not known sufficiently beforehand for pastures to be specially grazed to allow for good recovery; and, lastly, the management for the whole year must be sound for high production to obtain high points throughout the scale set out.

It is a pleasing feature of these competitions that the practices found to give good results in individual paddocks are being applied over the farm, as the improvements in the composition of the sward, in density, evenness, and in vigour, &c., are reflected in increased carrying-capacity of the particular paddock, and are therefore worth extending. Further, the leading pastures are generally on outstanding farms from a production point of view.

It is also of special interest to note that top-dressing, although important in maintaining production and a good type of pasture, is by no means the only important factor in securing a strong, vigorous, and dense sward of palatable and nutritious grass and clover species. Finally, the quality, quantity, and value of hay and silage as a reserve of food for stock must be improved if the pastures are improved, as they undoubtedly are, through the knowledge gained by means of these pasture competitions.

Otago and Southland District.

Contributed by the FIELDS DIVISION.

FIELD competitions were again conducted in the Otago and Southland district during the 1936–37 season. In Southland competitions were conducted in connection with (*a*) prize farms, (*b*) swedes, and (*c*) soft turnips. In Otago there were classes for (*a*) pastures, (*b*) swedes, and (*c*) ewe hoggets, and in North Otago for (*a*) mangels, and (*b*) swedes.

The competition for the prize farm in Southland is divided into two classes, one being for farms under 250 acres in extent and the other for areas over 250 acres. The properties are visited at least twice a year by three judges appointed by the Southland Agricultural and Pastoral Association, and one of these judges is the local Instructor in Agriculture. Points are awarded under the following headings: (1) Steading, yards, &c., 50; (2) subdivision and shelter, 40; (3) drainage, 40; (4) crops, 100; (5) stock, 175; (6) pastures, 145; (7) implements and plant, 25; (8) absence of weeds and rabbits, 25; (9) economics, 400: total points, 1,000.

Winners in Farm Classes.

In the season under review there were four entries for the class under 250 acres and five entries in the class over 250 acres. The winner of the small-farm class was Mr. G. Lindsay, of Drummond, whose

Fig. 1.—Judging the swedes in the Owaka district.

points according to the above scale were 39, 29, 36, 60, 125, 136, 22, 25, 288: total, 760. In the large-farm class Mr. J. T. May, of Winton, was the winner with points as follows: 49, 34, 38, 70, 140, 145, 25, 25, 290: total, 816.

Mr. Lindsay's farm, which consists of 199 acres of heavy flat, is utilized principally for the production of fat lambs, while a considerable proportion is used to produce oats for sale. The area of Mr. May's property is 372 acres of partly rolling and partly flat country, and here again the production of fat lambs is the main activity.

In the soft-turnip class in Southland there were four entries, compared with six last season, and the winner of this class was Mr. A. O. Fleming, of Mabel, who grew a crop weighing at 48 tons per acre and scoring 85 points. This crop was sown at the rate of 8¼ oz. on

2nd December after a ton of crushed limestone had been applied to the furrow. Before sowing, 2 cwt. of borated superphosphate (containing 20 lb. of borax) was top-dressed on to the ground, and 3 cwt. of a mixture of equal parts of superphosphate, basic slag, and Seychelles guano was sown with the seed.

Swede Classes.

The winner of the swede class in Southland was Mr. Jas. Stevenson, of Wendon, who grew a crop of Majestic swedes yielding 63 tons and scoring 98 points. The seen was sown at the rate of 11 oz. per acre in 28 in. ridges during the first week of November, and 2½ cwt. of a proprietary mixture of manure was sown with the seed. Mr. Jas. Grant, of Bayswater, grew a crop which yielded equally well, but he dropped a point for evenness. This latter crop was Masterpiece, and 10 oz. of seed was sown about the middle of November with 4 cwt. per acre of a mixture of equal parts of superphosphate, blood and bone, and Seychelles guano.

In Otago the heaviest crop, which yielded 75 tons 13 cwt., was grown on Chicory Farm, Inchclutha. There were 48 entries, compared with 43 the previous season. Early and thorough cultivation again proved of advantage in the production of high yields, while double ploughing, were practiced, proved of additional advantage, particularly where the crop followed lea. In North Otago the winning crop was that of Mr. A. Gray, whose crop weighed out at 48 tons 14 cwt. per acre.

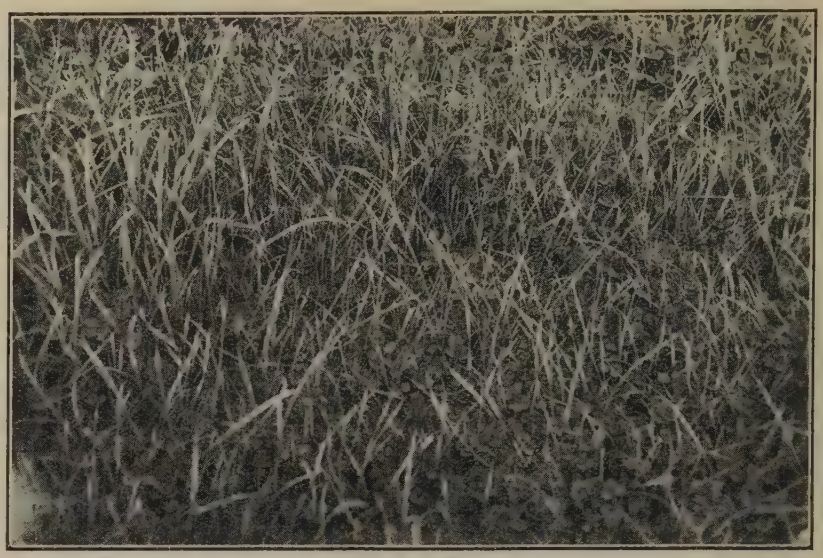


Fig. 2.—A close-up of Mr. A. Lindsay's champion pasture in Central Otago.

Mangel Classes.

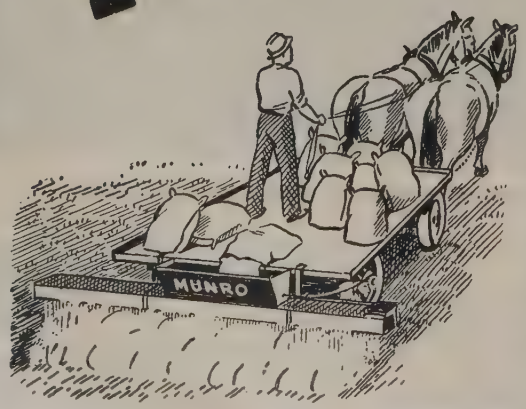
Mangel classes were confined to North Otago, and here seven entries averaged 56 tons 13 cwt. per acre. The winning crop was that grown by Mr. A. C. Hurst at Papakaio, and this weighed out at 70 tons 10 cwt. The mangel crop is one which might be given more consideration in North Otago. It is a crop that stands up to relatively dry conditions provided it gets a good start in the spring. No other fodder crop would be likely to yield anything approaching 56 tons on the average throughout this district.

The greatest interest in Otago centres around the pasture classes. Thirty-four entries were received, and these covered the districts of Central Otago, Lawrence,

1 Man does work of 8

and 3 ordinary Topdressers with the

Munro "Triumph":



. . . experience of Mr Kelly Caughey, Farmer, of Centre Bush, Southland. With his Munro "Triumph" attached to his horse lorry, on which he carries 3 tons of lime and super, he spreads, **without help**, as much in a day as he previously did with three drivers (working three machines), three mixers in shed, and two men carting out. The "Triumph" mixes and sows perfectly any two ingredients, or straight manure, or lime, or slag. An equally perfect grass seed sower—a three-in-one machine.

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Waitahuna, Milton, and South Otago. The champion pasture of Otago was that of Mr. A. Lindsay, of Fruitlands, Central Otago, and this paddock gained 92 points in the spring and 91½ points in the autumn, a total of 183½ points. This was a six-year-old dairying pasture composed of a good mixture of rye-grass, cocksfoot, timothy, and white clover. Although cut for hay after the spring judging, it made an excellent recovery, and the main grass at the autumn judging was cocksfoot.

Mr. Lindsay adopts a regular top-dressing programme, using chiefly 2 cwt. of superphosphate and 1 cwt. sulphate of ammonia per annum. Second place was secured by Mr. E. Iversen, of Earnscleugh, Central Otago, who gained 91½ points at both judgings. This pasture is a very old sheep pasture. Both of these placed pastures were irrigated. Mr. R. Brown, of Wairuna, South Otago, filled third place with a three-year-old pasture, scoring 180 points.

Live-stock Competition.

The live-stock competition consisted of classes for ewe hoggets. Just as three roots do not truly represent a crop, neither does a small pen of sheep represent a flock, and it is felt that the ewe hogget competition will result in a general improvement to the flock rather than improvement to a few individual members of the flock.

Three classes were decided on, and these were—(1) for ewe hoggets suitable for fat-lamb production, (2) for ewe hoggets suitable for wool-production, and (3) for ewe hoggets suitable for dual purpose. Two alterations were made to the rules for the season, and these were—(1) the reduction from 50 to 30 for the minimum flock, and (2) the number of hoggets to be 15 per cent. of the ewes put to the ram in place of 20 per cent. as previously.

Details of placings are as follow :—

Maniototo—

Ewe hogget for fat lamb : Mrs. Vera Blakely.

Ewe hogget for wool : Mr. W. Gibson.

Ewe hogget for dual purpose : Mr. A. Stringer.

Lakes District—

Ewe hogget for dual purpose : Mr. J. S. Brown.

Millers Flat District—

Ewe hogget for fat lambs : Mr. K. Wright.

Ewe hogget for wool : Mr. F. J. Smith.

Kelso District—

Ewe hogget for dual purpose : Mr. A. McPherson.

Value of Competitions.

These competitions are playing a useful part in farming in the southern provinces. They encourage farmers to study one another's methods, and the judging day, carried out, as it is, with frequent demonstrations, is a field-day from which much useful knowledge must come. Already the size of the parties accompanying the judges has grown, and many farmers look forward each year to this day's outing.

The general organization is undertaken by the Farmers' Union, agricultural and pastoral societies, and the Department of Agriculture working in complete harmony, and the judging is undertaken by stock-breeders of note as far as the live-stock classes are concerned, and by officers of the Fields Division in the field classes.

✤ ✤ ✤

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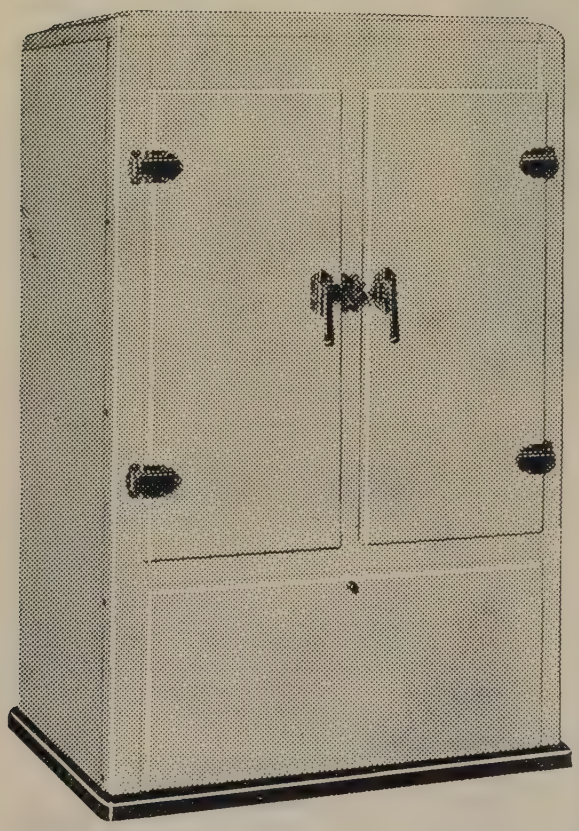

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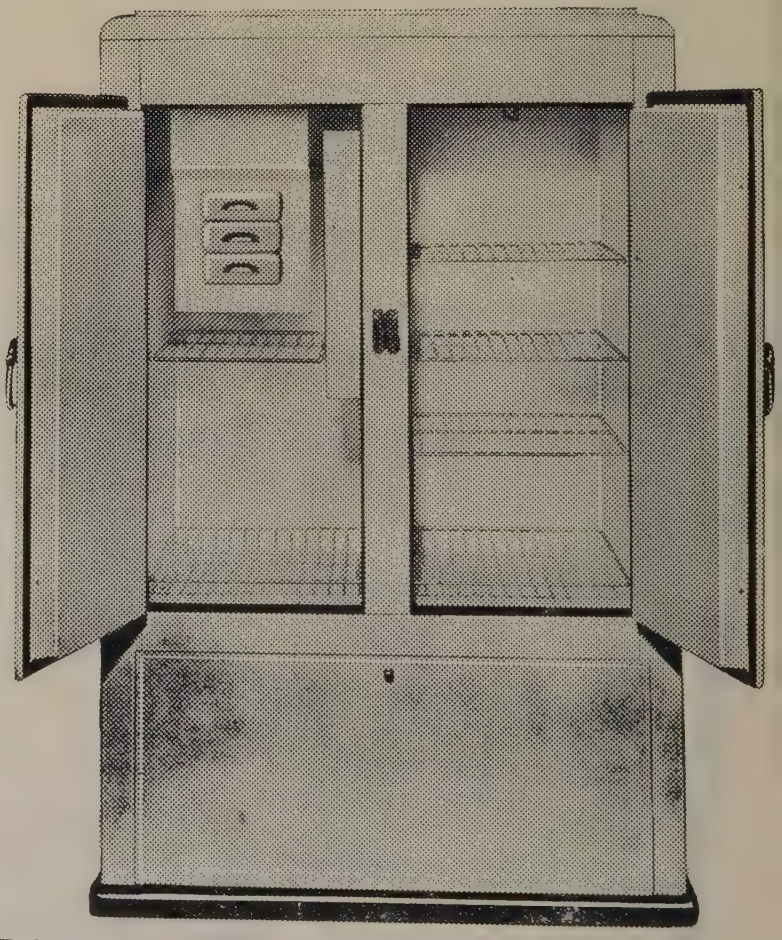

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The Home in the Country.

What the A.C.E. does for the Farmer's Wife.

VIOLET MACMILLAN, B.H.Sc. Organizer, Association for Country Education.

WHAT are all the farmers who read the *Journal* working for ? Health and happiness, companionship, a measure of comfort, a good name in the community, a happy home—perhaps all of these are the satisfactions which they, like most other people, want to get out of life. But when one takes time to study the families which show up as the happiest and healthiest and the most free from worries of every kind, one finds that the most prosperous farmers are not necessarily the ones whose homes are most blessed with health, happiness, order, beauty, and friendliness. And one is made to realize that it is the efficiency of the farmer's wife rather than that of the farmer which plays the bigger part in making life on the farm successful.

In the attainment of the good things which every one wants out of life the family is a partnership, the man's part being to earn the livelihood and the woman's to turn the livelihood into satisfaction, which comes from such things as physical well-being, clean, comfortable, attractive, and orderly surroundings, good physique and appearance, and happy family relationships. It does not matter which partner has the more difficult or the more responsible task, but it must be conceded that both are difficult and both carry considerable responsibility.

Benefits to Country Women.

But while farmers are being given every assistance with their side of the farm-home partnership, what is being done to help the farmer's wife to progress with hers ? Thanks to the development of the two large rural women's movements, the W.D.F.U. and the W.I., a great number of both direct and indirect benefits have come to country women. How greatly these organizations have helped the country woman to overcome her isolation and to adopt a progressive, outward-looking attitude can be testified by all who can compare conditions twenty years ago with those of to-day.

What has been provided to enable country women to secure information about the correct way to deal with the problems involved in home life ? Is there any service for them that might be compared with that given by the Fields Division of the Department of Agriculture, or have they any *Journal* to give them reliable advice, to enable them to guard their homes from sickness, to spend their time and energy to the best advantage, to buy with sound judgment, and to lead full and interesting lives ?

Fig. 1.—Students taking A.C.E. short courses study problems in a practical way.

Two Agencies.

There is no national service, and the only two agencies for giving such information are the services given by the University of Otago and Victoria University College respectively through the Home Science Section of the Association for Country Education and the Sarah Anne Rhodes Fellowship in Home Science.

Because of the limitations of finance neither of these services is able adequately to cope with the work, either from the research or teaching sides, although at least sufficient progress has been made to show that there is a very real demand on the part of the progressive farm woman for information, and also that there are several very practicable ways in which contact between home-science-trained tutors (or instructors) and the women interested can be effected.

How the Services Began.

The service in the South Island, which is just entering on its tenth year, owes its existence to the personal enthusiasm of Professor A. G. Strong, O.B.E., who as long ago as in 1925 took part in farm schools in conjunction with the officials of the Fields Division and the Otago Farmers' Union, and endeavoured to secure State support for the movement. As no New Zealand funds were available, the Carnegie Trust of New York was approached, and on her recommendation backed by the endorsement of the Council of the University of Otago, a grant of £1,500 a year for five years was made for an experimental service in home-science instruction for adults throughout rural Otago and Southland.

Thus came into being the Home Science Extension Service, which for five years (1930–35) gave a free service of radio talks (twice weekly), lectures at W.I. and W.D. monthly meetings (two-monthly), conducted leaders' schools, ran bottling clubs in conjunction with the Boys' and Girls' Agricultural Club, prepared and issued study boxes on home-science topics, and answered thousands of inquiries by letter and telephone.

Topics Presented.

Throughout all these activities emphasis was placed on the importance of prevention of sickness, the correct food for

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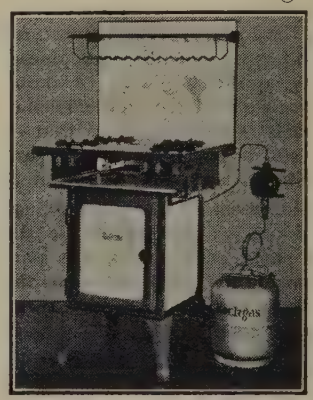

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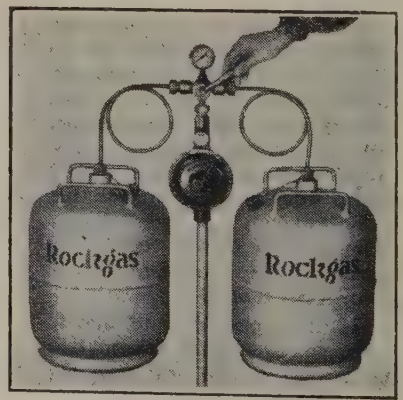

2 BOTTLE OUTFIT.

When one bottle is exhausted, you merely turn the lever and the reserve comes into action.

health, the living habits that promote health, the environment that makes for health, hygiene, sanitation, and clothing.

The information thus made available was secured by a study of the results of the world-wide research made by biochemists, physiologists, economists, and others, and from the staffs at the Home Science and Medical and Dental Schools of the University of Otago, which possessed special knowledge of New Zealand conditions.

Meanwhile in the North Island, acting on recommendations from the trustees of the Sarah Anne Rhodes bequest, the Council of Victoria University College set up the Lecturing Fellowship in Home Science late in 1932, which meant that from then on one home-science-trained tutor has been available to work throughout the Wellington, Taranaki, Hawke's Bay, Nelson, and Marlborough Provinces. The work mostly followed the lines installed in Otago, with lectures, short study courses, study boxes, and other postal services.

Thanks to the generosity of the Carnegie Corporation, a third service for rural people was also in operation from 1935 onwards throughout rural North and Mid Canterbury. This was concerned not with the practical problems of home life but with its cultural needs, and consisted of a library on wheels, driven by Mr. G. T. Alley, under the direction of Professor James Shelley, then Professor of Education of Canterbury University College.

Services Combined.

As the time approached for the original Carnegie grants to expire and there was still no prospect of securing finance within New Zealand to carry on the South Island services, the Carnegie Trust was approached with a request for a further grant. This request was acceded to on the condition that the two sections in the South Island should be united and that an attempt be definitely made to make the service if not self-supporting at least supported within New Zealand.

The new combined service was named the Association for Country Education, an organizer was appointed, headquarters set up at the University of Otago, and the two phases of the work were named the Home-science Section and the General Cultural Section of the A.C.E. respectively.

To ensure that some finance must be secured from the outset, the Carnegie Trust gave the new grant on a diminishing scale, dropping it by £500 annually. Thus, in the first year (1935) the grant would be £3,000, and in the final year (1939) £1,000, the onus being on the New Zealand Carnegie Advisory Committee and the organizer to find ways of carrying on as the grant dropped and, if possible, after it had stopped entirely.

Fig. 2.—J.H.C. girls study topics which include diet, appearance, use of leisure, home improvement, and business methods.

The first thing to be done was to decide which activities would be most helpful and the scale of fees which must be charged for them, and these then had to be offered to the rural community throughout Canterbury, Otago, and Southland, and the work begun.

The A.C.E.'s Services.

Because of the size of the area to be embraced and the limited number on the staff the travelling library service was no longer practicable, and as an alternative the hamper library service was evolved. For this Mr. G. T. Alley, the librarian, divided his books into sets of thirty, to be sent to groups of eight to ten people at monthly intervals. In place of the regular lectures given when the " bookmobile " arrived, an occasional lecture was all that could be offered. The fee for library membership was set at 5s. per annum.

A drama tutor, Mr. G. Worthington, was appointed to coach local groups. It was decided that people should be invited to join courses consisting of eight weekly lessons, followed by two weeks of production, for a fee of 5s. per head.

On the home-science side it was thought that the time had come when more intensive work than lecturing should be offered, and three of the tutors were allocated to give courses consisting of eight lessons on problems connected with either meals for the farm family, or home furnishing and decoration, or dressmaking. The fee paid for the eight lessons was set at £1 per head, or 2s. 6d. per lesson.

The fourth home-science tutor was given special work in organizing and conducting Junior Homemakers' Clubs for country girls between the ages of fifteen and twenty-five years. The programme offered by these clubs consisted of, first, ten monthly meetings planned to develop the abilities for leadership and organizing latent talent in the girls and to assist them to undertake projects involving the study of home problems, and, secondly, a week's short course at the Home-science School for two delegates from each club. The club membership fee was set at 5s.

Organizing the Public.

All these services were ready early in 1935, and through circulars sent out to officials of the W.D.F.U. and W.I. and others and by means of organizing tours, areas were quickly found where there was a real interest in the services being offered. Where people who wanted a library hamper were found, one of them was appointed librarian, their application sent in, and the first hamper sent without delay. When a district showed a real interest in drama a public meeting was convened and the course explained.

The time-table for the tutor's circuit was drawn up so that he could visit in succession all the surrounding small centres where drama groups of some fifteen to twenty-five men and women could be organized. A convener for each group was appointed, and a committee consisting of these conveners was set up to organize the festival which was to be given at the end of the course. Similarly, when it was found that districts wanted home-science tutors the district was circularized, an organizing meeting was held, study groups were set up, conveners were appointed, and the tutor's time-table was made up.

The library, the drama, and the home-science tutorial services were thus offered and utilized from North Canterbury to Southland, but the Junior Homemakers' Clubs could be offered only to the area within reach of Dunedin, as their's was

to be a continuous service which could not be handled by itinerant tutors who stayed in a district only long enough to give a short course.

Only the Woman's Institutes and the branches of the W.D.F.U. in Otago and Southland were therefore circularized.

The Response.

Some indication of the need which existed and the readiness with which the services were utilized can be judged from the following facts :—

In the first year there were fifty-one library groups, and these grew to seventy in 1936. In the latter years 655 people subscribed to library, and each group received on an average eight different hampers, containing 255 books, during the year.

The popularity of the drama course has been almost embarrassing at times. As only four courses can be fitted into each year, since each takes up ten weeks, there is usually a "waiting list" of districts where the people are waiting their turn to take the course.

The average membership for each of the four years has been 450, or about 110 per course, and the plays rehearsed and produced have each averaged just on eighty.

While the home-science tutors were being moved from place to place giving courses they were continuously engaged. Thus, in 1935 and 1936 they had 935 women in their classes, and in 1936 one tutor's class membership numbered 285 women.

Junior Homemakers' Clubs.

The Junior Homemakers' Clubs also took on well, and by 1936 there were twenty-three clubs, with an average membership of eight per club. The projects which the girls have for their year's club and home projects have been: 1935, "The Well-dressed Girl"; 1936, "Health and Good Posture"; 1937, "The Use of Milk and Vegetables" and "Bedroom Improvement"; 1938, "The Selection of Clothes for an Ideal Minimum Wardrobe" and "Health Records."

More Recent Developments.

Some of the figures quoted do not bring the records up to date, and the reason why more recent figures are not quoted is because as time passed new avenues for services were seen and more effective methods of work developed. Thus, in 1937 some of the books were withdrawn from the hamper service, and one thousand of these were loaned out to country libraries at a very cheap rate.

At the end of 1937 there was great demand for books through both these services and our funds were not adequate to meet it, and it was therefore thought best to give the A.C.E. library service as a going concern to the newly established Government Country Library Service, of which Mr. Alley had been appointed officer in charge, and in this way to ensure the continuation and expansion of the services already begun.

Study in Child Psychology.

With the money thus saved it was decided to engage an expert in child psychology so that New Zealand parents, like those in other lands, could, if they wished, form classes to study the problems associated with the growth of the child's mind. Miss D. Dolton, who has been appointed, is at present working in the Rangiora district, where some very interested study groups have been formed, and where a one-day weekly nursery school is soon to be conducted by the high school girls under her supervision. For the latter part of 1939 it is intended that Miss Dolton shall be available to meet parents in other parts of the A.C.E. territory, and possibly to write some articles and deliver radio talks.

It was found that, although the courses given by the home-science tutors were successful many opportunities for helping people were lost through the tutor always having to move on to her next waiting classes as soon as she had finished a course. Hence, people who were not members of her classes, or who had only begun to be interested towards the end of her time in the district, did not have an opportunity to benefit from her visit; and, moreover, it was found that often people could get no assistance with seasonal problems, such as food-preserving, dressing poultry, &c., because the tutor did not happen to be in the district at the right time of the year.

Resident Tutor Scheme.

To overcome these drawbacks, a resident home-science-tutor scheme was evolved, and in 1937, two, and 1938, three, of the home-science tutors were offered to the women's organizations in country districts in which a substantial amount of interest in homemaking studies had been shown.

The offer made was that the tutor would reside in their main centre from March to December and work in the surrounding area, provided the organizations in the district could promise to keep her busy and would set up a joint advisory committee to advise her and to act as her sponsors in the community. The responsibility of each organization was to guarantee £2 in payment for four lectures which were to be given at monthly meetings during the year, and collectively to undertake to secure a total enrolment of some sixty women for classes.

Tutors Kept Busy.

It was on this basis that Miss Ruth Grocott spent nine months in Eastern Southland in 1937, Miss Joan Buddle in Central Otago in 1937 and 1938, and Miss Margaret Fogo in North Canterbury in 1938, and Miss Ray Robins in Mid-Canterbury in 1938.

In all cases the tutors have been kept extremely busy, although in two cases the number of classes did not reach the expected figure. In addition to the lectures and classes, the tutors all have had an office day weekly, when they were available to members of the public for consultations, and they have visited a certain number of homes at the owner's request to give advice on some problem of room-arrangement or interior decoration.

The Future.

Next year, 1939, sees the A.C.E. receiving from the Carnegie Corporation its last grant, which will be just one-third of the sum needed for the year's finance, but thanks to the fees which have been saved from year to year this can just be made up, with very little over.

During the year it is proposed to continue all the existing services—the radio talks, the correspondence services from headquarters, and the activities mentioned above—along the present lines, but with modifications according to any constructive recommendations which may be received from those using them.

At the end of 1939 the A.C.E., as such, will have finished the work for which it was financed by the Carnegie Corporation —namely, *first, to evolve and carry on a service which would enable farm women to secure scientific and practical advice about their home problems, and, secondly, to demonstrate by results that money spent on such a service is money very well spent.*

After 1939?

After 1939? The answer to this lies with the Council of Adult Education which, under the Government, is responsible for the future of all phases of adult education throughout New Zealand. If a Dominion-wide service should be contemplated, all that the ten years have brought us in the way of knowledge and experienced gained, of ways opened up, of loyal and enthusiastic supporters would be gladly offered, because we believe that—

The most important industry in New Zealand is the management of the New Zealand home!

Reclamation of Tidal Flat.

Levelling and Regrassing at Invercargill.

A. STUART, Instructor in Agriculture, Invercargill.

THE reclamation of the tidal flat forming the upper part of the estuary to the west of the City of Invercargill has been brought into prominence by the action of the Public Works Department in levelling and regrassing an area on this flat for an aerodrome-site. No more convenient site could be found, and in this connection the city could not be better served.

The original work of constructing embankments to hold out the tidal waters was started some twenty-seven years ago, and took seven years to complete. The actual work was performed by the Prisons Department under authority from the Invercargill City Corporation, which controlled the estuary.

Originally, the whole of the reclaimed area—some 2,250 acres in extent—was submerged by spring tides, and partially so by ordinary tides. Figure 1 depicts the original raw condition of the flat, practically the sole vegetation of which was waewae or salt rush. Invercargill City is seen in the background.

Fig. 1.—The original raw condition of the tidal flat, with the growth of salt rush. Invercargill is seen in the background.
[H. Drake, photo.

Flood-gates Constructed.

The embankment is pierced at intervals by the large, open ditches (Fig. 2) which have been excavated to carry the surplus drainage water. Flood-gates have been constructed at the outlets, and these work automatically with the tides, opening at low tide and emptying the accumulated drainage water, and closing again with the pressure of the rising tidal water. The large open ditches, fenced and planted with trees on each side, are fed by a subsidiary system of fascined manuka drains, and present no danger to stock. The block has been well roaded, and open ditches have been constructed on either side of the roads.

Fig. 2.—Large, open ditches on the reclaimed tidal flat to carry the surplus drainage water. *[H. Drake, photo.*

In addition, a pumping-system was installed to help in reducing the water-level of the reclaimed land. Figure 3 shows the embankment, flood-gate, and the pump-house on left, and in the background the successfully grassed pastures being grazed by the dairy herds of the Borstal Institution. The latest type of pump installed is a double unit capable of delivering 5,000 gallons per minute, and it automatically ceases operations when the water-level in the drain falls to a certain point and resumes pumping either as a single or a double unit when the water rises again.

Stock Wintered.

When the land was ditched, roaded, and sown in grass these blocks were handed back to the Invercargill City Corporation, but a square mile of country —some 650 acres—became the property of the Borstal Institution in payment for the labour involved. At the present time, in addition to this freehold, approximately 500 acres are held on lease, and of this area probably one-quarter consists of brown-top dominant pastures and bare beaches. The stock actually wintered was 1,200 sheep (1,050 ewes, the balance being hoggets), 300 cattle (including the dairy herd of 90 cows), 22 horses, and 15 sows.

Until quite recently the work entailed on the other portions of the flat resulted in the home block being neglected to some extent, but at the present time more concentrated attention is being given to the draining and levelling of areas which had been passed over until now. This should result in a greatly increased production on this farm. As an indication of the fertility of the soil it should be mentioned that this season a block of 10 acres of Garton's Abundance oats yielded 95 bushels per acre. All the vegetables required by the institution are produced on the farm.

Fields Used for Hay.

Figure 4 shows a close-up of the type of pasture sward obtained on the farm, consisting mainly of perennial rye-grass and white clover. Meadow foxtail has done exceptionally well on the heavier ground, and many of these fields have been used successively for hay for many years. The sale of hay to the local suppliers of town milk has been one of the features of this farm for many years. As a general rule, the hay is baled from the stack.

In addition, two paddocks of rape and young grass were sold as lamb feed to fatteners this season. These paddocks, which were recently seen by the writer, present a vigorous appearance, and prove that a nurse crop can be utilized to advantage in Southland, where the rainfall is 40 in. per annum or more.

The initial grassing of this area was described more than twenty years ago in the *Journal of Agriculture* (Vol. XVI, pages 189–192).

Fig. 3.—The tidal flat reclamation, showing the stop bank and eight pumps in action. [*H. Drake, photo.*

Fig. 4.—A close-up of the type of pasture on the reclaimed tidal flat. [*H. Drake, photo.*

Concrete in Fencing.

FARMER (South Otago) :—

I desire to make a thin slab of concrete for a fence with dimensions 6 ft. by 3 ft. by ½ in. thick, reinforced with rabbit-netting. What would be the strongest possible mixture to use, and what proportion of cement, sand, and shingle ?

How would pure sand and cement (reinforced) compare for strength with shingle, sand, and cement (reinforced). I realize that the shingle would have to be very fine for a ½ in. thickness. Do you think a ½ in. thickness reinforced as mentioned would stand a reasonable strain ?

Fields Division :—

I am of the opinion that you would require much heavier panels than you contemplate making if you wish to have any success in their use for fence-construction.

Of course, the richer the mixture of cement and aggregate that you use the stronger the panel would be, but there is an economic limit to these proportions. A mixture of 1 part of cement, 1½ parts of fine aggregate (below ¼ in. in size) and 3 parts of coarse aggregate (above ¼ in. in size) is accepted as the strongest economic mixture, but, in making panels of ½ in. thickness only, you would be limited to the use of cement and fine aggregate.

For reinforcing, wire netting would be about the only material you could use, as any type of expanding metal would prevent your using any aggregate other than sand. With these materials a panel 6 ft. long by ½ in. thick would support a distributed load of only 8 lb. or 10 lb. per square foot, and might readily break under even a normal wind load. As a fence the panel would need to withstand rubbing or kicking by stock, and I can definitely state that the ½ in. being considered by you would be inadequate.

As far as cost is concerned, I think you would find that you could not manufacture the panels under the price of about £10 per cubic yard, and on this basis a ½ in. panel would cost approximately 11d. per foot, excluding posts—much too high a price for a fence which, I fear, would very soon break.

Agricultural Regulations.

Licensing of Stallions.

A. E. MORRISON, Solicitor, Department of Agriculture.

THE Stallions Act, 1938, which comes into force on 1st April, 1939, requires all stallions to be licensed after 1st August, 1939, if used for stud purposes for fee or reward except—

(*a*) Any thoroughbred trotting or pony stallion; or

(*b*) Any stallion of any other recognized light breed of horses; or

(*c*) Any stallion over two years of age on 31st July, 1939, and in New Zealand on that date or being temporarily out of the Dominion is subsequently brought back to New Zealand.

Thus the licensing provisions of the Act apply only to stallions of any of the heavy breeds, and it is made clear that no license is required where the owner of a stallion uses his stallion solely for the service of his own mares. For the purposes of the Act the age of a stallion shall be computed from the 1st August preceding the date when the stallion was foaled, and in cases of dispute the age shall be determined by an Examiner of Stallions by examination of the animal, and his determination shall be conclusive.

Conditions.

Applications for licenses must be made to the Registrar of Stallions, who must be a veterinary surgeon in the service of the Department of Agriculture, in a form of application to be prescribed by regulations under the Act, and the application must be accompanied by the prescribed fee. The stallion to which the application relates must then be examined by two examiners, both being veterinary surgeons, and if on examination the stallion is found to be free from disease and hereditary unsoundness a license in respect of the stallion will be granted by the Registrar.

In the case of an application for a license in respect of an imported stallion, if the application is supported by a certificate from a qualified veterinary surgeon in the country of export certifying that at the time of exportation the stallion was free from disease a license may be granted without further examination of the animal.

Every license granted shall expire on 31st July each year, and will come into force on the date specified therein or on the date on which it is granted, whichever date is the later. On the sale or other disposition of a licensed stallion the license may be transferred to the new owner.

Re-examination.

By direction of the Minister of Agriculture, any licensed stallion may be re-examined during the currency of any license. If the result of the re-examination by two Examiners of Stallions shows that the stallion is affected with disease the license in force in respect of the stallion shall be revoked.

If the owner fails to send the stallion for re-examination as directed by the Minister, the license may be revoked by the Registrar of Stallions. In either of the cases mentioned the owner shall be duly notified and, on request, shall return the license to the Registrar.

Barbed-wire Damage to Skins.

Concern at the losses on New Zealand hides for export arising from barbed-wire scratches is expressed in a memorandum issued by the Department of Industries and Commerce.

The following return of the percentage gradings of exports gives an indication of these losses :—

Grade.	Percentage of Total Skins.	Value in May, 1938.
		£ s. d.
No. 1	5	1 8 0
No. 2	55	1 4 0
No. 3	30	1 0 0
No. 3 inferior	10	0 18 0

On these figures, £112 is received per one hundred hides. If they were free from scratches the price realized would be £140, an increase of 25 per cent. As the value of hides exported last year was more than £1,000,000, a loss of £250,000 was sustained as the result of barbed-wire damage.

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"NECA" Suppositories contain two new antiseptics, non-irritating.

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Please ask your storekeeper to procure, or write us direct.

Manufactured by TINGEY & HUBBARD, LTD., Chemists, Feilding.

Appeals.

Where a license in respect of a stallion has been refused or revoked the owner may obtain a copy of the reports of the Examiners on the stallion and may, if he thinks fit, appeal for a re-examination of the stallion to a Board of Appeal consisting of three veterinary surgeons, one appointed by the Registrar of Stallions, one by the owner of the stallion, and the third member by the other two members of the Appeal Board, but if they do not make an appointment within the time fixed by the Registrar the third member shall be appointed by the Minister.

The Appeal Board is required to determine whether or not the appeal should be allowed and a license granted in respect of the stallion. The decision of two members shall be the decision of the Board of Appeal, and shall be final and conclusive. A copy of the decision must be supplied to the owner. If the appeal is successful, the fee paid for the appeal shall be refunded to the owner, and a license shall be granted in respect of the stallion.

Certificate of Soundness.

The owner of a stallion which is not required to be licensed before it may be used for stud purposes for fee or reward may be granted a certificate of soundness in respect of his stallion. For the purposes of the grant of certificates of soundness all the provisions of the Act as to the examination of stallions and the grant of licenses shall apply with the necessary modifications.

Powers of Entry.

Powers of entry on any land or premises are conferred on Inspectors under the Stock Act, 1908, for the purpose of ascertaining whether the Act is being complied with in respect of any stallion, and the owner may be required to produce for inspection any license granted in respect of his stallion.

Offences.

The owner of a stallion required by the Act to be licensed who uses the stallion or allows it to be used for stud purposes for fee or reward without a license commits an offence against the Act and is liable on a second conviction in respect of the same stallion to a substantial fine. The owner is also liable to a penalty for holding out or in any way representing that his stallion is licensed when a license has not in fact been obtained or is no longer in force.

It is also an offence where any person makes any false statement in respect of a stallion for the purpose of obtaining a license under the Act, or obstructs or hinders any Inspector in the exercise of his powers under the Act, or fails to comply with any lawful demand or requirement of an Inspector or the Registrar of Stallions.

Regulations.

Machinery regulations implementing the provisions of the Act are required to be made, and it is expected that the necessary regulations will be brought into force so as to commence on 1st April next.

New Poison Bait for Slugs.

Application Gives Heavy Mortality.

W. COTTIER, Entomologist, Plant Research Bureau.

A BAIT of paris green mixed with moist bran and sweetened with molasses or treacle has been used in New Zealand and other countries for some time as a means of controlling slugs. The writer's experience, however, is that it is far from being really efficient for this purpose.

Recently in English literature* accounts have been given of a new slug bait which seems very promising. It was so highly esteemed by those who tried it in England that the Ministry of Agriculture and Fisheries took up the matter for experimentation, and a preliminary account of the efficacy of this material against slugs and snails was published by Gimingham and Newton (1937).

The active ingredient of the bait is concontained in a solid fuel, "Meta," which is sold for heating curling-tongs, &c. It is known that the main constituent of this substance is metaldehyde, a polymerized form of acetaldehyde. The preparation is a white solid, usually sold in the form of sticks, each of which weighs approximately 4 grams.

The bait is prepared by powdering up one stick (4 grams) and mixing it thoroughly with about 1 quart of dry bran. Enough water is added to give a friable crumbly mass, the amount of water required being about 1 pint per 1 lb. of bran. It is stated that the addition of water is not necessary if the ground is moist. The bait may be broadcast, but best results are said to be secured by placing it in little heaps about 1 ft. apart over the area to be treated.

Efficiency of Bait.

A description of the results secured by the Ministry of Agriculture and Fisheries and shown in the article quoted will give some idea of the efficiency of this new bait. On one plot four small heaps of a mixture of 4 grams of the preparation to 1 quart of bran were placed out in the afternoon of 4th February and covered with tiles. On 5th February there were collected 253 slugs of three species that had been poisoned by the bait. It is stated that the owner of the garden continued observations, and that by 22nd February approximately 850 slugs had been counted on the plot, and more were still being caught in March.

In a second experiment on a field of cabbage, an area of about 45 square yards was being damaged by slugs, and trials of the bait were made on this area. In one of the experiments the preparation was used at the rate of 4 grams to 1 quart of bran, and this quantity was spread evenly over 1 square yard of ground with a small covered heap in the centre. The bait was put out on the night of 4th February, and the next morning on the two test plots, each of 1 square yard, 134 and 80 poisoned slugs respectively were found. Most of the slugs were on the edges of the plots, very few being at the central heaps. The bait continued to be effective for six weeks.

These two experiments show how the bait will attract and kill large numbers of slugs even during the winter, and it can be expected that much greater success would be secured in the spring and summer, when slugs are much more active.

Possibilities on Larger Scale.

A further experiment conducted by the English workers during April showed the possibilities of this particular bait when broadcast on a larger scale. The rate of broadcasting is not stated, but, as far as the writer can judge, was probably in the vicinity of 20 lb. per acre. The area treated was over 1 acre, and subsequent counts on 64-square-foot areas across the middle of the field gave an estimated mortality of slugs of some 50,000 per acre, while counts on square-foot areas nearer the hedges gave an estimated kill of 70,000 per acre. It is stated that similar figures were obtained in a smaller scale trial in the field.

The bait remains effective for a considerable time—certainly several weeks—if trouble is taken to rig up some sort of rough shelter to act as a protection from heavy rain. It will attract snails as well as slugs, but is reported to be of no use against other soil pests.

According to the observations of Gimingham and Newton, wild birds do not touch the bait, although these authors state that on one occasion poultry did eat it but without any detrimental effects. The bait is, however, detrimental to the health of humans, and all reasonable precautions must be observed in preparing and using it.

No Official Experiments.

From the work of the above two authors it is shown that the proportion of 4 grams (1 stick) of the preparation to 1 quart of bran, with or without water as required, made a satisfactory bait, and this is the formula they recommend. They point out, however, that this is based on preliminary work, and more detailed experiments are promised.

No official experiments on the efficiency of the bait have been conducted by this Division, but according to some small trials observed by the writer the bait undoubtedly attracts and kills slugs. The purpose of presenting this information is simply to bring before the notice of those whose gardens suffer damage from slugs and snails the possibilities of this method without in any way recommending it. It seems to give great promise, and is well worthy of a trial in appropriate situations, as these pests commonly cause heavy damage to vegetation.

It is well known that applications of hydrated or slaked lime at the appropriate time of the year will usually give good kills of slugs where large areas are affected, and it is likely that the bait described in this article will find application only on a small scale. For example, there are many growers who object to a covering of lime over their flower plants and beds, as this detracts from their ornamental value, and in such cases conditions are most suitable for the use of a bait.

Literature Consulted.

In the preparation of the above article, free use has been made of the following paper—

1937: GIMINGHAM, C. T., and NEWTON, H. C. F. "A Poison Bait for Slugs." *Journal of Min. of Agric.*, Vol. 44, No. 3, pp. 242–46.

* *Gardening Illustrated*, 2nd May, 1936; *Gardeners' Chronicle*, 19th December, 1936, 23rd and 30th January, 1937.

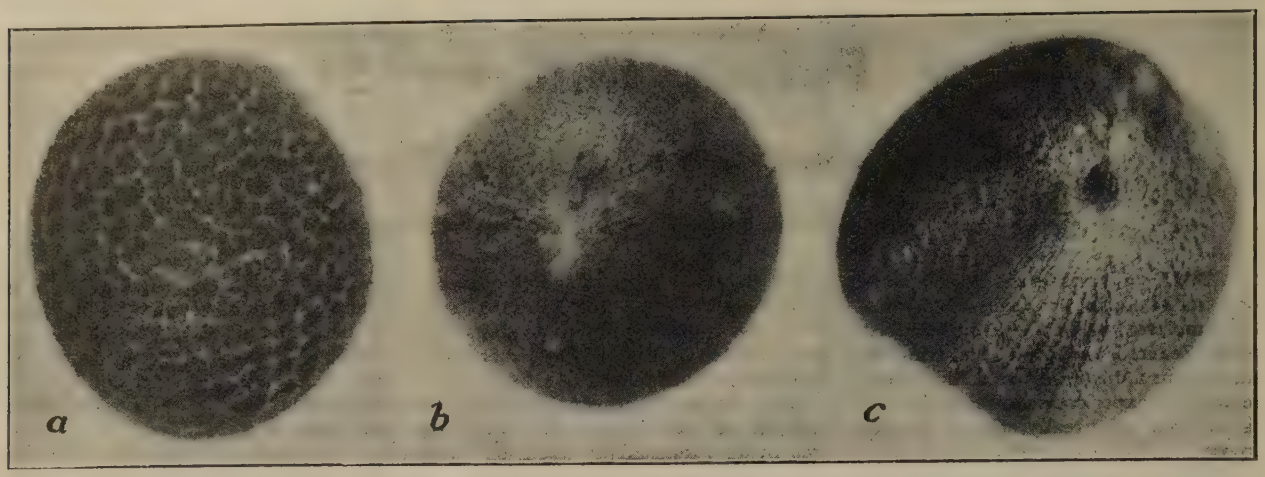

Fig. 1.—(a) Seed of black mustard (Sinapis nigra); (b) Seed of charlock, or wild turnip (Sinapis arvensis); (c) Swede-seed.

Charlock and Black Mustard Impurities in Swede Seed.

E. O. C. HYDE, Seed Analyst, Seed-testing Station.

DURING the past year it was reported from several parts of the country that swede crops sown on clean ground were seriously infested with charlock, or wild turnip (*Sinapis arvensis* L.), and black mustard (*Sinapis nigra* L.).

When samples of the seed used were sent to the Official Seed-testing Station it was found that in each instance the seed was the source of the trouble. The seeds of charlock and black mustard closely resemble those of swedes, but they can be distinguished by careful examination.

Some of the differences are apparent in the accompanying photographs. The seeds of black mustard are readily distinguished because of the reticulate ridges marking the surface. The seeds of charlock can be recognized by their smaller average size, smoother surface, and pungent flavour. Moreover, they are almost exactly spherical, whereas swede-seeds are characterized by two more or less distinct furrows where the seed-coat is depressed in conformity with the shape of the embryo.

Where difficulty is found in identifying seeds of charlock advantage is taken of the fact that when heated in chloral-hydrate solution the seed-coat turns red.

Charlock, especially, is a very troublesome and persistent weed-seed, and those handling swede-seed should make certain that their stocks are free from this impurity.

Minerals in Fertilizers.

T. B. I. (Rangiriri) :—

I would like to know—

(1) If rock salt contains other minerals beneficial to stock as compared with ordinary chloride of sodium ?

(2) What minerals does the fertilizer sold on the open market as 30 per cent. potash contain beside the potash ?

I wish to ascertain whether it is profitable to buy 30 per cent. potash at £8 per ton or chloride of sodium at £4 per ton in respect to the benefits stock would be likely to derive.

Live-stock Division :—

Rock salt is, in the main, composed of sodium chloride, and must be considered as containing only sodium chloride from a stock point of view. No doubt there are traces of other ingredients which may easily be described as impurities, but these are present in such small amounts that their effects on stock would be negligible.

Fields Division :—

The fertilizer known as 30 per cent. potash salts has about the following composition: Chloride of potash, 48·6 per cent.; sulphate of magnesia, 10·2 per cent.; chloride of magnesia, 4·2 per cent.; chloride of soda, 26·2 per cent.; sulphate of lime, 2·2 per cent.; matter insoluble in water, 3·5 per cent.; water, 5·1 per cent.: total, 100·0 per cent.

This fertilizer contains a guaranteed minimum of pure potash (K_2O) of 30 per cent. This is the potash contained in the chloride of potash shown above. The fertilizer is used for its potash content. Chloride of soda does not contain potash, and therefore cannot be compared with 30 per cent. potash salts.

Veterinary Notes for the Farmer.

Discussions on First-aid Measures.

Contributed by the Live-stock Division.

Colic in the Horse.

The horse is more subject to colic than any of the other domestic animals. The reason for this is because of the small size of the stomach in the horse and the impossibility of vomition in that animal.

The term " colic " is usually accepted as indicating abdominal pain. This may be due to a variety of causes, but the most common form met with in horses is usually the result of digestive disturbances, caused as a rule by unsuitable or defective food or irregularity in proper feeding. The causes of colic can be summarized as follows :—

(1) Overfeeding. This is intensified if the fodder is one which is difficult to digest.
(2) Sudden change of food, such as is seen in horses suddenly changed from grass feeding to chaff, oats, and hay.
(3) Working the horse immediately after feeding.
(4) Mouldy or musty fodder.
(5) Allowing access to drinking-water soon after feeding. This is especially dangerous in horses unaccustomed to it.
(6) Horses with weak digestion are frequently the subject of colic.
(7) A sudden lowering of the temperature of the surface of the body in cold wet weather.
(8) Drinking very cold water.
(9) The consumption of frosted roots.

The most common forms of colic are (1) flatulent, (2) spasmodic.

Flatulent colic is usually the result of eating food which tends to give rise to rapid fermentation. The most outstanding symptom is distension of the abdomen by gas. Evidence of pain is shown by general uneasiness, pawing with the fore feet, or kicking at belly with the hind feet. The horse lies down and rises again quickly. Sweating in patches might be observed.

Spasmodic colic is accompanied by spasm of the muscular wall of the bowel, during which the horse may throw himself violently and roll as result of acute pain.

Prevention of colic in horses must be along the lines of avoidance of those irregularities of feeding which predispose to an attack.

Treatment of severe cases calls for immediate assistance by a veterinarian.

Advisory Service on Veterinary Matters.

Beginning with this issue, a selection of veterinary notes for the farmer will be a monthly feature in the *Journal*. Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

As a first-aid measure a drench composed of 1 oz. of chloral hydrate dissolved in 1 pint of water and shaken up with 1 pint of linseed-oil will be found useful. In cases of " windy " colic, 1 oz. of oil-of-turpentine can be added to this drench.

The Horse Bot-fly.

Most owners of horses are familiar with the annoyance caused to horses during the summer months by attacks of bot-flies in depositing their eggs on the hairs of the legs, shoulders, jaws, throat, and around the lips. Nevertheless, very little attempt is made to apply measures which would tend to lessen the deposition of eggs, or to destroy them when laid, in order to prevent the eggs reaching the horse's stomach, there to develop into the larvæ or " bots."

Preventive measures include the application of dressings which are repellent to the fly. A mixture of equal parts of pine-tar and lard applied to the parts to which the flies are most liable to attach their eggs is said to act fairly well, but it must be repeated at weekly intervals. The eggs, when deposited, can be removed from the hairs by scraping or singeing. A 2-per-cent. solution of carbolic acid used as a wash will destroy the eggs attached to the hairs.

Mechanical devices are used on the horse's head to prevent the fly laying eggs on this part. A piece of sacking tied beneath the jaws or in front of the nose is sometimes employed for this purpose.

Answers to Inquiries.

Red Water in Cows.

" J.E.P." (Inglewood) inquires the cause and treatment of red water in cows.

The condition referred to as red water in cattle in New Zealand is of dietetic cause ; it is usually associated with feeding roots without a proper balance of hay in the ration. Hay which has gone musty in the stack will quickly give rise to the trouble. The condition usually responds to a saline drench. Give 1 lb. each of common salt and Epsom salts dissolved in 1 quart of warm water and allowed to cool. Adjustment of feed is necessary.

———

Calf Sickness.

W. P. (Riverton–Gummie's Bush R.D.) :—

This year I am having some trouble with calf sickness. The first three I kept have done well and are now nearly three months old. The next two developed trouble almost as soon as they were taken from the mothers. One would neither suck nor drink, and I had to force-feed for a time. Eventually it started to drink, but it was never very keen. Sometimes it would take its milk and sometimes it would not. The other one did well for a week or so, and then became affected like the former. Later, some scouring of a pale greenish nature was noticeable. This did not appear to be very severe, and has now disappeared, and I would say that they have gone to the other extreme, if anything.

Both these calves are now about six weeks or more of age. They are running

outside, mostly on good pasture, and appear to eat a fair amount of grass, but they are very poor and miserable. I use nothing but pure milk for feeding, and the amount per feed twice a day is approximately ½ gallon. This has always been my method of rearing and feeding, and I have never had the slightest trouble previously.

I thought at first that the trouble may have been a chill, but since they are ailing so long with no sign of improvement I am suspicious of some other trouble. Might the trouble be worms of some nature? What can be done to help them?

Live-stock Division :—

I do not think the trouble you have experienced has been due to worms, especially as the calves are so young. What has been responsible, in all probability, has been a dietetic factor or some infection. The milk given to the calf at the outset should be the first drawn—colostrum or biestings—of the mother, since this possesses special nutritive and laxative properties which are essential for the well-being of the calf and is difficult to supply in any other form.

In all cases milk should be given to the young calf at the temperature at which it would get it from the cow (101° F.–102° F.). The use of cold milk can be responsible for indigestion, with loss of appetite and some scouring. Feeding should be regular, and for the first eight weeks the food should be given in at least three meals per day.

The possibility of infection must not be overlooked; this can happen by navel infection or from the use of dirty feeding-utensils. The navel cord should be dressed at birth with an antiseptic as a precaution against the ingress of disease-producing bacteria. A lump of "bluestone" (copper sulphate) can be used for this purpose, and it has the added advantage of causing the cord to shrivel up quickly.

A very important matter is in regard to feeding-buckets and any other utensil used in calf-feeding. They must be kept scrupulously clean at all times. This can only be done by scrubbing out each utensil with cold water and thoroughly scalding with boiling water after each meal. Afterwards the utensils should be put in a clean place in the sun until used again.

Each calf should be watched closely for signs of scours, because, if severe, the calf receives a check from which it does not easily recover. On the first indication of scours the food should be immediately cut down to half the usual amount and a dose of castor-oil given. Administer one to three tablespoonsful, depending on the size of the calf, and shake up with twice the quantity of hot water.

The calves should at all times be in clean, sheltered surroundings on healthy pasture. A well-drained new grass paddock is the best. Young calves are extremely subject to digestive derangement if they have access to only sour, dirty, rank pasture.

Contagious Abortion.

The control of contagious abortion rests largely in the adoption of hygienic measures in herd-management, by maintaining replacements from heifers bred in the herd, and isolation of purchased animals at calving-time. The blood-test for the disease which is carried out free at the Department's Laboratory affords a useful indication of the extent of infection in the herd. The result of abortion-infection in a herd cannot be regarded but as most serious, its effects on breeding often involving severe losses through sterility. In many countries various schemes of abortion-eradication have been undertaken. An attempt at control along the lines of establishing abortion-free herds in a definite area would appear to be well worth the serious attention of dairy-farmers.—*Annual report of Director of Live-stock Division.*

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Farm Practice and Management.

Contributed by Officers of the Fields Division.

Hillside Barn for Storing Hay.

HILLSIDE pits are frequently used in the dairying districts where ensilage-making is carried out extensively, but it was only recently that I encountered a farmer employing the same principle for storing his baled hay. Ensilage, of course, is heavy material to handle compared with hay, and various labour-saving devices are employed to eliminate the heavy lifting.

There are differences of opinion on the merits of stacked and baled hay, but on many sheep-farms any small drawbacks as far as the quality of the baled material is concerned are far outweighed by the advantages in the ease of handling. Dutch barns are ideal storehouses, but the initial cost of erection is high, and much hay is wasted by being exposed to the weather. There are, however, many farms situated on ground that is sufficiently undulating to permit the construction of a cheap but efficient barn under a bank.

The hillside barn for storing hay.

Construction of Barn.

Mr. Edgar Jones, of Waiau, has constructed a barn on the south-east side of a slope, and it is near paddocks he cuts for hay. Formerly he stacked his bales and covered them with iron, but even then there was a certain amount of loss, as the sides of the stack were exposed to rain. Some stacks also dry out more quickly on the side of the prevailing wind and settle evenly.

The permanent shed was made by excavating a place in a bank, most of the work being carried out on wet days. Apart from labour, the total cost for nails, iron, and drainpipes was approximately £20. The floor is covered with shingle, and field tiles are laid all around the bank to take away the seepage water. The walls have a slight slope to prevent their falling in, and Mr. Jones hopes to complete the job by concreting them in the near future.

The dimensions are: Height of wall at back, 20 ft.; height of studs in front, 8 ft.; length, 48 ft.; width, 36 ft.; distance between studs, 12 ft. by 9 ft.

The studs and purlins are of larch, and were the thinnings from a nearby plantation, but blue-gum would serve equally as well. The front studs exposed to the weather are laced to silver-pine posts.

This shed holds approximately 2,800 bales. The whole building is fenced off with gates at the top and bottom, and a roadway leads in at the bottom right hand corner, so that a lorry can back right into the barn.

Filling the Barn.

When filling, two sheets of iron are lifted at the top opposite the gates, and the bales are dropped from the lorry on to the ground and then fed down a chute. One man unloads the lorry and one man stacks down below. The chute is made in three sections of 10 ft. each, and can be hooked together, so that it is possible to direct bales all over the floor space. By using hooks, the bales are easily moved around and are stacked without any lifting.

A more elaborate structure with a gabled roof and perhaps studs of railway iron might be built, but the general layout is certainly very simple and saves a great deal of time and labour.

I wish to thank Mr. Edgar Jones for his kindness in furnishing the particulars for this article.

—*A. S. Nash, Instructor in Agriculture, Rangiora.*

Mowing to Control Pastures.

WHILE the axiom that good control of pastures is not necessarily good management is not disputed, there still remains the necessity of preventing grazed pastures from running to seed.

In Southland, particularly, the certified type of rye-grass, being definitely earlier in the spring, has a tendency to produce seed-head early in November, and when relatively dry or early springs are experienced even in October. This calls for heavy grazing during October and November, and this can be carried out in these two months without any danger to the fattening lamb, which plays so important a part with Southland farming operations.

With uncertified types, or even local lines of old pasture true perennial type, the rushing to seed generally occurs a month later, and at this stage it is not possible by means of the ewe flock to prevent the seed-head forming without risk of the lamb suffering, and at this period grass recovery takes longer and a dry spell is more likely to be experienced.

Paddocks are, of course, closed for hay and, in certain districts, ensilage, and north of Winton fairly large areas are closed for seed-production. This undoubtedly helps the farmer to obtain control over his grazing pastures, but even with these advantages he is often forced to use the mower for topping.

The accompanying photograph shows two paddocks, the management of which has differed. The paddock on the right has been grazed sufficiently to prevent any formation of seed-head, while the paddock on the left was not sufficiently grazed and the seed-head formed was topped in December. This photograph was taken last February, and it can be readily understood from a perusal of it that the topping was performed too late to be of any service to the production of the paddock that season.

The paddock on the left has not been sufficiently grazed, while the paddock on the right has been grazed sufficiently to prevent any formation of seed-head.

In Southland the bulk of the grass growth is confined from October to April and during this period, because of the evenly distributed rainfall (particularly over the coastal country as far inland as Winton and Edendale), rye-grass and white-clover growth is continuous in a normal season, with white clover tending to be dominant in February.

If, however, the rye-grass is allowed to rush to seed-head and is not checked either by extra stocking or mowing, this desirable feature is checked and the pasture-production is lowered, bringing in its train less carrying-capacity and decreased fattening ability.

The point which should be emphasized is that the topping of pastures by means of the mower—a necessary practice, admittedly—should be carried out as early as possible in the season. The average Southland fat-lamb producer has not at his disposal beef cattle, which could be used for the purpose of control.

—A. Stuart, Instructor in Agriculture, Invercargill.

TWO CHEAP FARMS.

WHANGAREI DISTRICT.

110 acres, about 40 acres flat, balance undulating, when further improved will carry 45 cows besides other stock. 5-roomed house, ample out-buildings, 1½ miles from township. Price only £1,750 as a going concern, including 30 cows, horse, bull, 3-cow milking plant, &c. £700 deposit satisfactory.

HANDY TO HELENSVILLE.

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Simple and Efficient Pig Layout.

Fig. 1.—A general view of one complete unit of this type of pig layout.

WHILE many and varied types of pig layouts are encountered throughout the rural districts of this country—all of which undoubtedly have their advantages as well as their disadvantages—few will surpass the simple efficiency of the one outlined in this article as far as general requirements are concerned.

The special features of this layout are as follow:—

(1) The farrowing houses have been designed to serve two small paddocks either together or one at a time, and

(2) The houses have been brought forward to within about 8 ft. of the race instead of occupying a place roughly about the centre of each paddock.

Fig. 2.—A close-up of the pen and house taken from one side. The "creep" is blocking the view of the unopened gate on the far side of the pen.

Controlling the Paddocks.

The space between the race and the house has been concreted and the area wired off to form a pen, which offers facilities not only for the feeding of sow and litter (see the creep across the corner in Fig. 1 which is very readily removable if and when necessary), but also, by means of two gates, one each side of pen, allows one or both paddocks to be used from the one house.

Fig. 3.—Another close-up of the pen and house, showing the position of the "creep," the sow's drinking-trough, and the position of the waterproof box for the storage of meal.

Such an arrangement very simply permits the feeding of sow and litter either together or separately, the speedy isolation of sow from litter for any purpose, the running of two paddocks at once or, if necessary, the use of only one while the other is allowed to freshen up, and finally, the maintenance of sanitary conditions so vitally important to the health of pigs and the success of those engaged in farming them. In addition, many other uses for this layout will, no doubt, suggest themselves to practical farmers.

Figures 1, 2, and 3 give a clear conception of the completed layout, while Fig. 4, also taken on the same farm, illustrates

the old type of piggery that was used for some years, with hardly the maximum amount of convenience and comfort for those attending to the pigs.

Waterproof Lid on Meal-box.

It is also worth noting that the box shown in Fig. 3 is fitted with a waterproof lid to preserve from the weather the meal contained therein and used to supplement skim-milk in the pig's trough. With such a convenient arrangement there should never be any excuse for omitting to balance up the ration of skim-milk with essential meal.

The house itself is approximately 8 ft. by 8 ft. in area, and does not differ materially in construction from the modern conception of this unit, most of which could readily be adapted to this form of layout. The concrete yard is also about 8 ft. by 8 ft., the floor being 2 in. thick. The pen is very simply constructed of four totara posts, a few feet of 4 in. by 1 in. O.B. rimu and a little heavy-gauge galvanized wire netting. The whole should be well treated with creosote or otherwise adequately painted.

Fig. 4.—A view of the old layout on the same farm. It is noted chiefly for the inconvenience and discomfort caused to the person operating it.

I am indebted to Mr. L. Brown, Property Supervisor, Native Department, Whakatane, and his assistant Mr. J. Merritt, for their courtesy in making available much of the information contained in this article.

—C. Taylor, Fields Instructor, Whakatane.

Permanent Silos.

THE question of the conservation of spring and summer grown pasture for winter feeding is now before the farmer. The wise man on the land has the choice of conserving his surplus grass either as ensilage or hay.

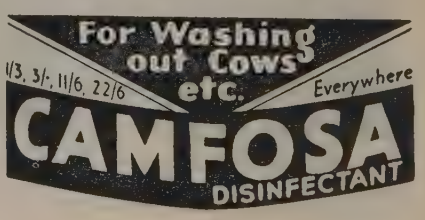
Recent research regarding the quality of good ensilage places it on a footing comparable with an equal bulk (dry matter) of good hay. In addition, it is pointed out that ensilage maintains the milk flow over periods of feed shortage with no impairing either of its quality or colour. In the Nelson District dry, summer conditions, with consequent poor pasture growth, make it imperative for fodder-conservation to be carried out in the early season. The making of good ensilage requires a good silo in order to reduce wastage to a minimum.

(a) The silo with the boards removed from the front opening. (b) A close-up showing the grooved wall into which the boards fit.

Permanent Structure.

A permanent structure of the type illustrated can be used year after year, and has the advantage of a detachable roof. Further, loading-in may be carried out from the top without an elevator or forking, and carting-out done from the base. Stout boards are placed in the front opening, and when the level of ensilage falls they may be removed as required and the product easily loaded out on to a farm cart.

The silo illustrated has a height of 16 ft. and a similar interior diameter. It is constructed of reinforced concrete, having 6 in. walls throughout. The front opening is approximately 4 ft. from the ground, and this is carried to 2 ft. 6 in.



from the top, thereby giving an effective opening of 9 ft. 6 in. The width of the opening is 3 ft., and this is channelled or groved on either side to a depth of 3 in., the grove extending to 1 ft. from the top.

The estimated capacity of a silo of this kind is 90 tons to 100 tons, and the total cost of erection was in the vicinity of £100. While the particular model illustrated has the roof supported on the silo by two heavy beams, it is possible, at slight extra cost, to have the roof on rails so that it can be slid off and on as required.

—D. M. E. Merry, Instructor in Agriculture, Nelson.

Effective Drain-digging Machine.

IN Fig. 1 a rather old-fashioned but nevertheless most effective type of drain-digging machine is illustrated. Powered by a Diesel tractor, this machine can be drawn at a fair walking pace while gouging out the drain to a depth of 6 in. to 8 in., so that the opening-up of a chain of drain is only a matter of minutes.

Under dry conditions, particularly, a certain amount of loose soil falls into the drain (Fig. 3) which would, of course, have to be removed, and the bottom finished off by hand if tiles were to be laid.

On the occasion on which these photographs were taken a manuka fascine drain was being made, and after the brush had been laid the job was rapidly completed with the aid of an ordinary ditcher (Fig. 4).

—N. Lamont, Instructor in Agriculture, Masterton.

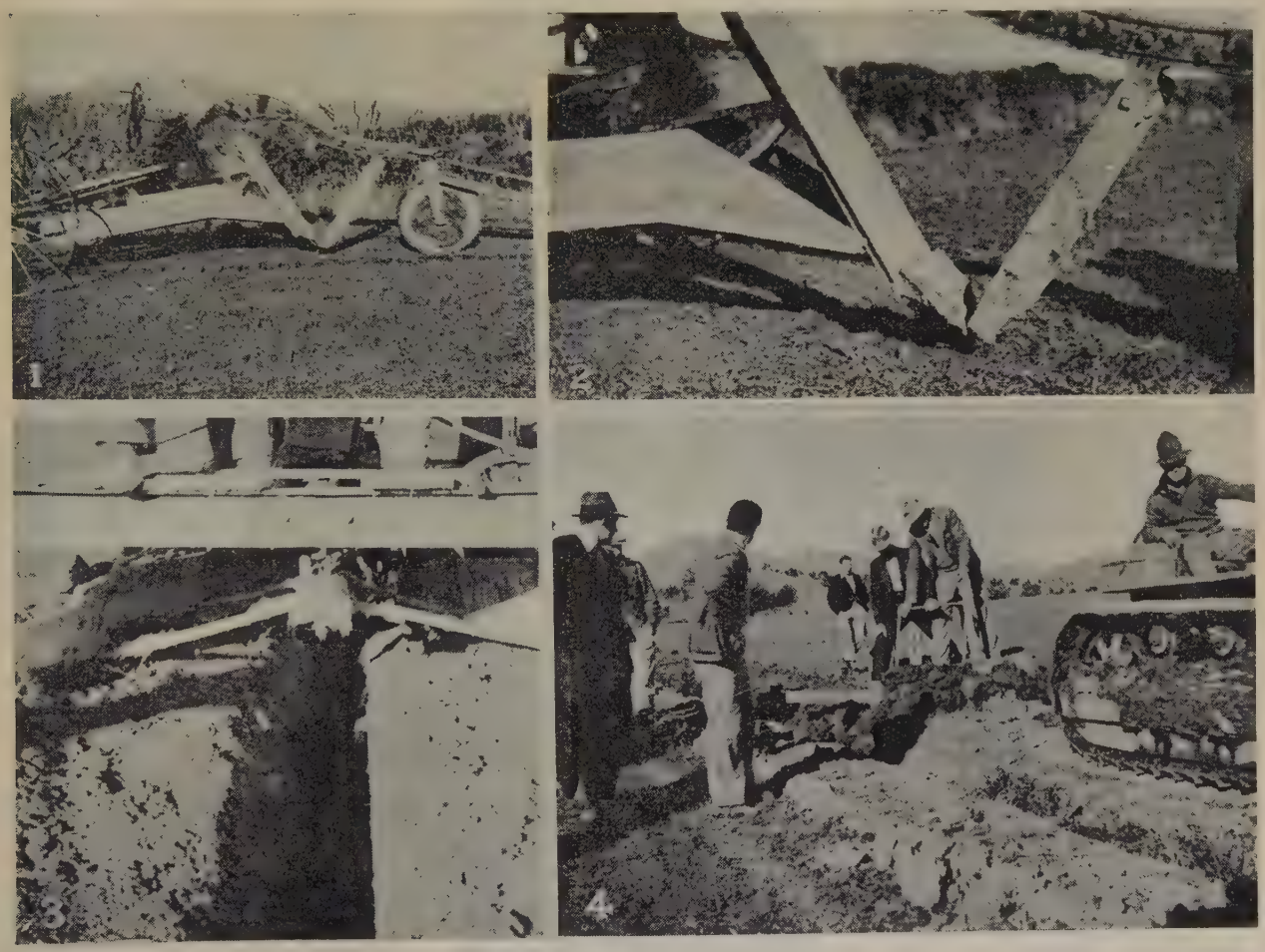


Fig. 1: The drain-digging machine. Fig. 2: A close-up of the implement. Fig. 3: Even under dry conditions a fairly clean drain is obtained. Fig. 4: Filling in the drain.

Cultivator Adapted for Grass Harrow.

Fig. 1.—A close-up showing the harrow points in detail.

BY removing the cultivator shoes and attaching a harrow point made from the leaves of a disused car-spring to each spring tyne Mr. E. M. Green, Pearce Valley, Pokororo, Nelson District, has adapted his cultivator to a useful pasture harrow. The cost of conversion was 17s. 6d.

The harrow points were made by heating the car-spring to a red-hot condition and cutting sections at an angle to a sharp point with a cold chisel.

The shank of each harrow point was then bent through an angle of 45 degrees so that it could be coupled flat on to the spring tyne of the cultivator and have the thin edge of the original spring leaf turned to act as the digger point.

After heating, these harrow points were retempered in water. In order to eliminate twisting of the harrow point under working-conditions and when coupled to the spring tyne of the cultivator, each of the coupling-bolts was heated prior to the nuts being bolted hard on. The clip holes of the car-spring obviated the necessity for redrilling holes for attachment.

Fig. 2.—The cultivator with the harrow points attached.

The modified spring-tyne cultivator as described above has served as an efficient, though cheap, grass harrow.

—D. M. E. Merry, Instructor in Agriculture, Nelson.

Rationed Pasturage.

Fig. 1.—An electric fence used for rationing. If each new break contains just sufficient for one period of rationing the portion already grazed acts as a holding-paddock.

THE experience on the Ruakura grazing trials in this dry October has amply confirmed the view expressed in an article in the May issue of the *Journal* that winter-spelling in the way recommended is a cheap insurance against a late spring. Normally, the three winter-spelled fields which were available for grazing in October would have been grazed from 8 in. to 3 in. in six days, but by rationing this pasturage they lasted for fourteen days *and the cows were fully fed.*

This period could have been greatly extended, but the cows were given as

much as they could eat of the winter-spelled pasturage each day. The method was to give them two hours on the winter-spelled pasture immediately after the morning milking and two hours immediately after the evening milking, and then to put them into the previously rationed-off field, using this as a holding-paddock.

Time for Grazing.

Many farmers give less time than this when rationing-off pasturage; some give an hour, others half an hour, and many give no rationed pasturage after the evening milking.

We found that after the evening milking the cows were replete to the point of disgust after two hours on winter-spelled pasturage and were standing about, too satisfied to pick another mouthful. After the morning milking, however, two hours on winter-spelled pasturage filled them up quite well, but they were still anxious to snatch a few mouthfuls as they were being shifted into the holding-paddock.

This may be accounted for partly by the fact that they graze to some extent all day and are not very empty in the evening, but from midnight to morning they generally do not graze but lie down, and consequently are very hungry after the morning milking, taking longer to become replete. This herd also has two hours longer at night than in the daytime in which to become hungry.

Fig. 2.—Winter-spelled pasturage ready for rationing off.

Fig. 3.—Using the previously rationed-off field as a holding-paddock.

Number of Fields.

We also found that in a prolonged spell of slow growth, such as occurred in October, 1938, three winter-spelled fields are not enough. Four fields are considered a minimum for continuous rationing by this method, as, by the time the fourth will have been grazed, the first will have recovered.

The size of the fields, of course, should be that which allows stocking with the herd at the rate of about twelve to eighteen cows to the acre. In the Ruakura example given here the concentration of cows was fourteen to the acre.

—E. R. Marryatt, Fields Instructor, Ruakura Farm.

Unusual Method of Grazing.

AN unorthodox method of grazing was observed recently on the property of Mr. G. Matthews, Marlborough.

The mare in question was apparently rather unobservant in its early youth and mistook a cliff for an incline, suffering a consequent injury to its neck. The result is as depicted.

The neck is capable of slight movement only, and in order to graze a series of "levelling down processes" have to be instituted before the feed can be reached.

The mare, now fourteen years old, is quite normal in other respects, and works well both in the shafts and in a team.

—D. R. Wilkie, Instructor in Agriculture, Blenheim.

Need for Good Farm Shelter.

FARMERS universally agree that good shelter-belts are necessary for good wintering of stock, but the opinion that these equities can be dispensed with in the warmer weather seems to be equally prevalent. The necessity of good summer shelter was never more forcibly emphasized in the Waikato than last summer prior to and during the outbreak of facial eczema. During the hot weather stock utilized every vestige of shade available, and farms on which this aspect of farming had been attended to reaped many benefits for the forethought.

All farms need complete shelter, but there are many on which shelter is not complete. One of the most notable faults is the open, draughty bases of the older single-row barriers. Although the trees provide shade in the summer, they make very draughty fields on all but calm days.

At least two rows of trees suitable to the soil should be used for good shelter.

Fig. 1.—A good shelter-belt of Eucalyptus macarthuri and Cupressus lawsoniana.

The first should be a row of tall, fast-growing trees to provide high shelter which will give wind protection to the centre of the field and provide the maximum shade with their long shadows. The second should be a row of bushy, shorter-growing trees to fill in the open spaces at ground-level and prevent the shelter being draughty. These trees are often topped to increase their density near ground-level.

Fig. 2.—A draughty single-row shelter of Pinus radiata. Note the damaged stalks of Cupressus lawsoniana.

Useful combinations for a two-row shelter are: Lombardy poplar (*Populus fastigata*) and *Cupressus Benthamï* for land which is inclined to be wet, and *Eucalyptus macarthuri* and *Cupressus lawsoniana* for well-drained situations. Another decorative and useful shelter can be made from silver birch (*Betula alba*) and barberry (*Berberis vulgaris*), preferably a deciduous variety.

Wide fencing to protect young trees and allow the lower limbs of the older trees room to spread without being severely damaged by stock is essential for a draught-proof barrier.

—W. T. Brown, Instructor in Agriculture, Hamilton.

Eradication of Ragwort.

DEALING with the use of ammonium thiocyanate for killing ragwort, G. W. W. (Cambridge) asks whether this chemical was proved unsuitable as being itself a fertilizer and effective when mixed with phosphate.

In reply the Fields Division states: The results of early experiments with ammonium thiocyanate were published in the March, 1935, *Journal of Agriculture*, and the material apparently gave promising results, but since then a great deal has been learnt about the ragwort plant and the difficulty of complete root kills. Roots left unkilled may remain dormant in the soil for many months and then find their way to the surface and produce fresh plants.

Last year an intensive programme of ragwort research was carried out. In the course of this work trials were conducted in which ammonium thiocyanate, sodium chlorate, and other weed-killers were compared. In these trials sodium chlorate gave better results than even three times the quantity of ammonium thiocyanate. Even sodium chlorate does not kill all the roots or all the plants.

I suggest that, although ammonium thiocyanate contains 37 per cent. nitrogen, it will be more economical to use sodium chlorate to suppress the plants and super and other fertilizers to encourage the grass and clover.

Horticultural Instruction.

Contributed by Officers of the Horticulture Division.

Orchard Notes.

Seasonable Spraying and Harvesting.

ALTHOUGH the fruit harvest will occupy growers' time very fully for the remainder of the season—and naturally such work will take precedence—efforts will still have to be made in dealing with pests and diseases which become prevalent in the late summer and autumn. February is usually a warm month when insect pests may reach their maximum activity.

In northern districts, where a second brood of codling moth may occur, February is regarded as a critical month, when it is quite common to experience a late and often serious infection. Leaf-roller caterpillar may also cause serious damage towards harvesting-time unless control measures are pursued. It is necessary, therefore, except for earlier varieties, to continue the use of arsenate of lead at regular intervals through February into March; otherwise the work carried out to date may be so much wasted effort should the season favour these pests.

Serious Losses.

Serious losses have often occurred through discontinuing the use of arsenate of lead too early. During rather dry periods which are accompanied by high temperatures red mite is likely to increase so rapidly that growers are sometimes caught unawares. Unless a careful observation is being maintained, the bronzing of foliage through red-mite injury may be the first indication of its presence. By that time very serious damage which cannot be repaired for the season has occurred.

An application of a summer-oil 1–100 should be made as soon as the mite appear, and very thorough spraying is necessary to secure control. In the case of severe infestation it is advisable to repeat the application within ten days to destroy any mite which escaped the first application and also those not destroyed hatching from summer eggs. The spraying programme should be so arranged as to allow a clear ten days following a sulphur spray before applying it.

Spraying for the control of fungous diseases will still be necessary in the districts which experience highly humid conditions. Late infections of black spot may occur on such varieties as Sturmer, Dougherty, and Statesman if spraying is not continued to a later period.

General Spraying.

The general spraying should continue along the lines indicated in previous notes, but on varieties having foliage which is liable to spray injury colloidal sulphur 2 lb. to 100 gallons should be the preferred fungicide. Lime sulphur, except for Dougherty and Statesman, should be used more sparingly for the remainder of the season. In northern districts where bitter-rot (*Glomerella*) is troublesome it is advisable to revert to Bordeaux mixture as a fungicide, using a 1½–3–50 mixture. This spray may be combined with summer-oil where it is necessary to use the latter against red mite. To prepare 100 gallons of the mixture of Bordeaux and summer-oil first prepare the 100 gallons of Bordeaux mixture, then mix 1 gallon of oil with water to the consistency of thin cream, and with the agitator running pour slowly into the Bordeaux already prepared.

Late varieties of peaches, particularly Golden Queen, which may be grown for canning and requiring a fair degree of maturity before picking, should be sprayed with a combination of lime sulphur 1–200 plus colloidal sulphur 2 lb. to 100 gallons up to the time when the fruit is fully grown.

Harvesting Operations.

Care in handling fruit in all stages is very necessary to avoid serious losses through rots which may develop from skin injuries. Strict supervision is required in picking, carting fruit into the packing-shed, and in grading and packing. The following instructions may be passed on to pickers:—

Pick the fruit with stems intact by lifting the fruit and turning it back towards the spur. Where picking-bags are used, place the fruit in the bags but do not drop it. Fill the bags only moderately full before emptying the fruit into cases. When picking from ladders this is especially important, as moving about on ladders with a well-filled bag is a common cause of damage. Have picking-boxes handy so that filled bags are not carried far. When emptying from bag to box, lower the open end of the bag gently into the box and withdraw the bag slowly. Picking-boxes should not be over-filled so as to cause damage to fruit in stacking cases with loose fruit. Similar care should be exercised in handling the fruit through the various operations in the packing-shed.

First of all, grading-machines should always be kept free of accumulating dirt by frequent cleanings, especially in those parts against which the fruit moves. Tipping fruit on to the grading-machine hopper should be done carefully, easing the fruit down from the tipped case by means of a loose canvas flap. The overfilling of bins on the grading-machine, causing packers to rake down fruit hurriedly, is another common cause of stem-puncture injury.

Time for Picking.

The stage of maturity for picking is largely a matter of the choice of market. Apples for export require earlier picking than fruit for immediate consumption, although export fruit must not be picked in an immature state. Apples intended for immediate sale and consumption are best tree-ripened.

In picking for export it is important to remove at one picking all fruit which has attained sufficient maturity, irrespective of colour, and then to have it graded into the correct grades. If allowed to remain on the tree until the colour for the higher grade is attained it may become overmature for long-distance transport. The slight change in ground colour from green to yellow and the ease with which fruit separates from the spurs are better guides to the proper stage of maturity than the high colour so often looked for.

It is important in the exporting of apples to avoid, as far as possible, fruit from trees carrying a light crop. With such varieties as Cox's Orange Pippin and Dunns, which are notoriously biennial in bearing habits, fruit from lightly bearing trees in the " off " year is very subject to bitter-pit and breakdown, and is therefore better disposed of for immediate consumption.

Pears require to be handled expeditiously, and no time should be lost between picking, packing, and placing in cool storage. Undue delay in dealing with fruit intended for export hastens maturity to such an extent that a risk is caused of serious losses in overseas shipments.

Grading and Packing.

The grading and packing of fruit, whether for export or local market, requires to be done in an exacting manner, and all operations require careful attention to see that standards are maintained. With compulsory standardization on the local market for apples, pears, and lemons, more care and attention to details are required than have been practised in the past.

All defective fruit—diseased, badly russeted, and misshapen fruit—and fruit with the skin broken should be eliminated. Strict grading of the saleable fruit according to colour and allowable blemishes should then be made. Failure to separate the fruit into the respective grades is not in the interests of standardization.

Important points in connection with local market grades are sometimes overlooked. For instance, in Extra Fancy grade there is a greater restriction in sizes. With most varieties 216 is the minimum, but Cox's Orange Pippin of 252 count are allowed in Extra Fancy, and in Delicious 198 is the minimum. Cookers in the Extra Fancy grade are limited to 180 as the minimum size. Wrapping is advisable for all dessert apples and pears of the various grades, and is particularly important in marketing pears, except in the district in which they are grown.

Care in Packing.

Serious marking and deterioration of pears may occur in bare fruit carried over quite a short distance. Much care is required in actual packing to avoid undue bruising. Packing fruit incorrectly sized and " angle " packing are two common causes of packing bruises which should be studiously avoided. Packers should aim at producing a " crown " pack, so that there is no undue pressure on the end fruits to cause bruising, while still packing to give a substantial " bulge."

When fruit is accurately sized and placed squarely in the case to preserve " pockets " and the pack is consolidated as the case is filled, a reasonably tight pack is secured and little damage should result. Sufficient bulge is necessary to ensure that the pack is still firm after shrinkage and handling. Slack cases should always be repacked, and should never be sent forward to prejudice the remainder of a consignment. It is important in wrapping fruit to use paper of the correct size, so that fruit is completely wrapped and given adequate protection.

Attention to such details as wiring, labelling, and handling to give the package a good appearance is most important, as any lack in this respect creates a bad impression on buyers. Uniformity is required in handling, and growers should insist on employees studying the requirements carefully and carrying out the regulations.

Shed conditions should always be perfectly hygienic. No reject, rotting, or diseased fruit should be allowed to remain in or near the packing-shed; otherwise fungal rotting in the packed fruit is likely to occur to an excessive degree and thus greatly depreciate the value of a consignment.

—N. J. Adamson, District Supervisor, Nelson.

Citrus Notes.

Points in Buying an Orchard.

SOME indications were given last month as to the prerequisites for a successful citrus-grower. Citrus-fruit growing is a healthy open-air occupation, but, like any other profession or trade, an apprenticeship is not only desirable but necessary. The more the intending grower can learn of general horticulture the better will he be qualified for this occupation. It requires a wide general knowledge, for up to the present time not only did a grower require to know how to grow but also how to sell.

The desirable characteristics of the orchard-site may be cited as follows :—

(1) *Well-drained Soil.*—Citrus will grow on varying types of soil; the one thing it will not tolerate is " wet feet."

(2) *Frost-free Area.*—Orange and lemon trees vary in their frost-resistance, and stocks upon which trees are worked also vary in their degree of susceptibility to frost. At the present time the only areas recommended for commercial plantings are portions of the east coast areas of the Auckland Province.

(3) *Topography.*—A level or gently undulating area with a northerly aspect.

(4) *Shelter.*—A well-sheltered locality is essential. Natural shelter is seldom adequate, and hence the intending purchaser must realize that planting cannot be recommended until the shelter is adequate.

(5) *Soil.*—A soil rich in humus is desirable. Any hard pan within 2 ft. of the surface cannot be too strongly disapproved.

(6) *Distance from Transport.*—The distance from rail head, port, or central packing and curing shed are items which are apt to be overlooked until one has the orchard in bearing, when any such oversight may prove of vital importance to the success of the enterprise.

(7) *Distance from other Growers.*—In general, it is desirable to purchase an area in proximity to other orchards, for then one is able to observe the degree of success obtained by others and endeavour to rectify or improve upon past efforts. Proximity to other growers is also of value in that one is then able more readily to join a growers' organization for discussion of mutual problems, attend lectures and field-days, and probably be more within access of the local Orchard Instructor, who is always willing to assist to supply the necessary information.

(8) *Waste Land on Property.*—If an area is being purchased for a citrus orchard the minimum amount of waste land should also be acquired, unless for a specific purpose. If such land is purchased and is not self-supporting the price paid for it and its yearly upkeep must be added to the price of the actual orchard area. It sometimes occurs that such land—unsuitable for subdivision or other farming—may tend to make an economic orchard an uneconomic property. It is difficult to determine the ideal citrus-orchard area. If too small, the necessary equipment, capital invested therein, and depreciation thereon will bulk too largely in the costs of production on a per-case basis. On the other hand, too large an area places the owner in the position of an overseer dependent on outside labour, which is often not available when required. A medium between these two—probably from 5 acres to 10 acres—is the desirable mean.

(9) *Cost of Land.*—The actual price paid for the orchard land is a minor matter if all the major factors are right, but this does not infer that one is justified in paying a price out of all proportion to the value of the area. The orchard depends upon the orchardist, and a neglected orchard may be of less value than the land on which the trees stand, as such trees require to be removed and burnt prior to the commencement of any other farming operation.

(10) *The Orchard in Bearing.*—If one is purchasing a developed or partially developed orchard there is one main item for consideration, the trees and the fruit produced thereon, and by them should the purchaser assess the value of such orchard.

Routine Operations.

If the first oil spray was applied last month the second should be put on this month, 3 per cent. certified summer oil.

If the first oil spray is just being applied remember to follow it up with another thorough application three weeks later to eradicate the red scale this season and have clean fruit next winter.

Maintain cultivation, as February is often a dry month. If a cover crop is to be planted preliminary investigations should now be made of the most suitable varieties available. The budding season is drawing to a close, so that trees needing treatment should be top worked as soon as possible.

—A. M. W. Greig, Orchard Instructor, Tauranga.

Viticulture.

Seasonable Grape Recipes.

AS the ripening season for grapes will soon be here a small collection of recipes for profitably utilizing surplus fruit will probably be acceptable.

The usual causes of failure in making jelly are an excess of sugar, a lack of acidity and pectin, and over-boiling, which converts the pectin. If the fruit-juice is not decidedly tart, either lemon-juice or citric or tartaric acid crystals may be added.

In case of non-setting from a lack of pectin in over-ripe grapes the juice from green apples sliced and stewed with their skins, pips, and cores for ten to fifteen minutes may be added in the proportion of one measure of apple-juice to two of grape-juice. To ascertain whether the grape-juice contains enough pectin to jell properly, mix a spoonful of juice with a spoonful of methylated spirit. A large lump of jelly is formed when there is sufficient, but if only a few strings or flakes are formed the juice is lacking in pectin.

Albany Surprise grapes are well supplied with pectin, and make both excellent jam and jelly. Some of the European varieties, especially when they are on the ripe side, contain less pectin.

Before attempting to make large quantities of grape jelly it is advisable to prepare small samples and note the results.

Grape Jelly.

Crush some nearly ripe grapes. Place them in a shallow aluminium or enamel pan, cook slowly, stirring until they are well mashed and the juice separates freely. Boil for a minute or two, and then pour pulp into a double, wet cheese-cloth. Tie it, and hang it up to drain until cool, when a little pressure on or twisting of the cloth around will extract more of the juice. Add a little water to the pulp, cook it and strain it again, and add the second juice to the first. The juice of the first straining gives the finest-quality jelly, and can be used alone if desired.

To each pint of juice add 1 lb. of sugar. Bring it to the boil, and when it flakes on the uplifted spoon or jellies on the edge of the pan run it into hot jars. Cool quickly but avoid draughts, which would cause the jars to crack. Cover with paraffin wax, fix the covers, and store in a dark cupboard. When the wax is cold run a knife dipped in hot wax between the glass and the jelly just below the surface; this will ensure a perfect seal.

Green-grape Jelly.

Boil green grapes in cold water until tender, take them out and strain them, run through a sieve, add their weight in sugar, and boil fifteen minutes. Set in proper dishes to cool.

Spiced Grapes.

Pulp 4 quarts of Albany Surprise grapes, boil for five minutes, and skim off the seeds, which crush, and place in a muslin bag with one teaspoonful each of bruised cloves, cinnamon, and allspice. Place the bag of spices in a pint of vinegar and boil for fifteen minutes. Add the vinegar with 3 lb. of sugar to the pulped grapes, and cook the whole until thick. Run into hot jars and seal. Serve with cold meats and game.

Grape Sauce.

Five pounds of grapes, 4 lb. apples, 1 pint vinegar, ¼ lb. onions, 2 oz. garlic, 2 oz. salt, ¼ oz. allspice, ¼ oz. cloves, ½ teaspoonful pepper. Boil one hour, then strain and boil again. Bottle while hot.

Pickled Grapes.

Take nearly ripe, firm-fleshed grapes (Golden Queen, for instance), and pack them into jars. Boil 1 oz. of peppercorns, two dozen cloves, and 2 oz. of ginger root (all bruised) in 1 gallon of vinegar for fifteen minutes. When cold, pour the vinegar over the grapes, covering them well to allow for absorption. A week later pour off the vinegar, boil it again, and return it when cold to the grapes. The pickle is ready for use in about a month.

Grape and Pear Jam.

Proportions: 2 lb. ripe grapes and 1 lb. pears to 1 lb. sugar. Prepare the pears the previous evening; peel, cut into quarters, and take out the cores. Cover them with powdered sugar and leave them until morning. Seed the grapes with a quill (or skim them off). Cook on a slow fire for approximately one hour.

Grape Jam.

Seed the grapes, and to each 1 lb. add ½ lb. of sugar. Cook on a slow fire for an hour, stirring. If a spot of jam between thumb and finger will form a thread the jam is cooked. If the grapes are previously crushed the seeds can be skimmed off during the cooking.

Grape Pie.

Wash, stem, and seed some nearly ripe Golden Queen or other firm-fleshed variety of grapes. Pile them high in the middle of the dish, scatter some sugar over them, and cover with a light crust. Cook for about three-quarters of an hour. Serve with cream.

Apple and Grape Tart.

Partly cook the apples, then add a cupful of grapes to an ordinary pie-dish of apples.

Stewed Grapes.

One pound of grapes, ¼ lb. sugar, and one-half tumbler of water. Seed the grapes. Boil the sugar and water, add the grapes, and bring the whole well to the boil, then pour it out into a dish and let it cool.

Flavouring Syrup.

Wash and crush the grapes. Add one part of water to four parts of grapes and boil them until the pulps are well broken down but not enough to soften the skins completely. Drain in a cheese-cloth jelly-bag until cool, and squeeze lightly, measure and add an equal volume of sugar. Bring again to the boiling-point, and seal in sterilized bottles or glass jam-jars. This syrup is used in flavouring drinks, sherbets, and similar preparations.

—J. C. Woodfin, Vine and Wine Instructor, Te Kauwhata.

Cool Storage Notes.

Overhauling the Refrigerating Plant.

BEFORE cooling for the season begins the refrigerating-plant should be thoroughly overhauled, the coils scraped and painted, and the cool chambers thoroughly swept and cleaned. Care should be taken to leave the doors of the chambers open to allow paint odours to escape, as all fruits are very easily tainted by the odours given off by tar, kerosene, bitumen, paints, &c.

When preparing for the precooling of soft fruits the refrigerator should be run continuously so that the heat from the insulation of the chamber walls is removed before the fruit is stacked in the cool store. This precaution is also necessary when pears are the first of the new season's fruit to be cooled.

Reducing the Temperature.

On the other hand, some varieties of apples, such as Jonathan and Sturmer, are beneficially affected when the cool-storage temperatures are reduced gradually over a period of several weeks. By reducing and holding the temperature at 38° F. for the first week, then slowly cooling and holding at 36° for a few weeks, it will be found that the temperatures may then be reduced and held at 34° to 36° without fear of injury.

The too-rapid cooling of the fruit when first placed in cool storage is recognized to be responsible for a good percentage of flesh collapse and soft scald. A temperature of 34° F. is now being accepted as the lowest temperature necessary for holding most varieties of apples. A few exceptions are Delicious, Yates, and Granny Smith (after it has been allowed to mature before placing in cool storage). These varieties may be successfully held at pear temperatures—*i.e.*, 32° F.

Seasonal Conditions.

Seasonal conditions play a large part in the keeping qualities of apples. Independent chambers are necessary in order to obtain the best results in storing apples subject to flesh collapse and soft scald. In this manner it is possible to apply the high temperature treatment early in the storage life of the fruit, and so to eliminate flesh collapse and soft scald and yet reduce the temperature in time so that the texture of the fruit will remain crisp and the quality unimpaired by overmaturity.

All cool-chamber doors should be examined for defects, as the padding which forms the seal is a potent source of loss in the efficiency of the store when it is allowed to become faulty by constant use.

—A. Powell, Cool Storage Officer, Wellington.

Tobacco Notes.

Danger of Leaf-miner Infection.

THE planting of tobacco in the Nelson District was completed at the beginning of December. Growers are advised to keep a careful watch for evidence of leaf-miner. This pest attacks the leaves which were attached to the young seedling tobacco-plants at the time of planting. These leaves do not grow larger, but ripen off when about the size of half an envelope. They make a convenient place for the miner moth to lay its eggs. These hatch out in ten days to a fortnight, according to the weather conditions.

The infected leaves are quite worthless to the grower, and are easily recognized by the brown marks caused by the larvæ working between the two skins of the leaf. It mines between these skins, hence the name miner grub.

There are three periods of miner infection. The first is at the end of November or early December, and the second, arising from the offspring of the first infection, occurs about the time the flower buds are first showing. Thus, infection is hard to combat. The third takes place at the time the tobacco is full-grown and ready to harvest, which is about the end of February. This infection may almost ruin a crop of tobacco.

If the early seed-bed leaves which show infection with miner larvæ are hand-picked and destroyed at the time of the first or second hoeing of the crop there will be very little, if any, further infection.

Suckering and topping will be undertaken about the middle of January. A careful watch should be kept during this operation for any miner-larvæ infection.

Cultivation should be done carefully, and not deeper than 3 in., in order to avoid touching the roots of the plants, which are now spread through the soil between the rows. Roots which are broken or scraped are very liable to the mosaic disease, which enters the plant from the soil through the abrasions or wounds on the epidermis or skin of the roots.

Rough hand-hoeing close to the base of the plant is detrimental at this stage of growth.

—*C. Lowe, Tobacco Instructor, Motueka.*

Book Review.

"Insects of Citrus and other Subtropical Fruits," by Henry J. Quayle.

W. T. GOODWIN, Assistant-Director of the Horticulture Division, and late Director of Agriculture for Cook Island.

IN dealing with such a comprehensive subject as the title "Insects of Citrus and other Subtropical Fruits" implies, a vast amount of ground lies open for exploration, and the author of this work, Professor H. J. Quayle, seems to have spared no effort to cover the subject not only thoroughly, but also in a most practical manner. He renders it of considerable value, no doubt, to the scientific worker, but, what is of more importance from another point of view, he makes his subject readily understandable in plain terms to the practical grower of this class of fruit.

Wide Range Covered.

The book covers a wide range, and one might be forgiven for thinking that practically every pest of the kind enumerated had been dealt with within its pages, but, unfortunately, we know only too well, supported by the knowledge of scientific investigators, that the range of insect and other pests never seems to be complete. Some few exceptions are notably absent in the work under review, particularly the species of fruit-fly and some other pestilential insects to be found in the South Sea Islands. This, no doubt, is accounted for by the fact that the author, or for that matter any other competent investigator, has done little or no work in that particular field, and in new country to be explored the pioneer always has before him that glorious expectation of possible new discovery, no less in the field of entomology than in other directions.

However, this in no way detracts from the service-ability of the volume under review, which contains nearly six hundred pages devoted to a thorough description and life-history of an endless number of pests which are the bane of the citriculturist and grower of the other kinds of fruit mentioned.

Subjects Classified.

The subjects are classified under headings according to the various kinds of fruit, each being dealt with separately, and not only are these features clearly expressed, but copious notes are supplied on origin and distribution, covering all parts of the world. The work is divided into what are considered to be "major" and "minor" foes to be contended with, and, in addition, the volume is well indexed, making it easy for ready reference to any particular phase which may be required by those in search of knowledge.

Another important feature of the book from the point of view of practicability are the chapters dealing with the control of the insects enumerated, including their destruction or control by parasitical methods to the most modern methods of fumigation and spraying with insecticides. In dealing with the latter phases of the subject the author supplies some good material relative to the mechanics of application of the various methods, a point which is, unfortunately, only too frequently overlooked even by many modern orchardists. Attention is also drawn to certain aspects where danger may exist, under conditions outlined, of causing damage by injury to the foliage and/or fruit if proper precautions are not observed.

Spread of Infestations.

Resistance to control methods as the result of successive generations bred under environment conducive to their destruction—a subject which has a peculiar fascination to many investigators, professional or lay—has not been overlooked, and a number of instances are cited where this phenomenon has been given special attention.

One fact that is impressed upon the observant reader is the great danger, which is always imminent, of the spread of these infestations from country to country. Fortunate indeed is that land which may harbour only a few of the many pests to which this class of plants is susceptible, and no effort should be spared in maintaining satisfactory precautions to prevent their introduction in such countries where any specific pest does not already exist.

["Insects of Citrus and other Subtropical Fruits," by Henry J. Quayle (583 pages and 377 text figures), is published by the Comstock Publishing Co., New York, U.S.A.]

Vegetables, Small Fruits, and Flowers.

Contributed by the Horticulture Division.

Cleaning Glasshouses and Planting Crops.

THE harvesting of the outside tomato crop is well under way during February, and the harvesting of the crop under glass is usually drawing to a close. As soon as it is finished the house should be thoroughly cleaned and the land sown down or planted. Any delay not only exhausts the soil unnecessarily, but permits fungous plants and insect pests to increase and become more firmly established.

Under any system of intensive cropping probably the most important single factor on which success depends is cleanliness. Especially is this the case under glass where the same crop is grown annually. One is invariably dealing with infectious diseases of a more or less serious character, and the usual precautions should be taken and the cleansing very thoroughly carried out.

Destruction of Fungus.

Just what these diseases and pests happen to be will be best known to the one who has had charge of the house and has been supplying its requirements. They will doubtless include the leaf-mould fungus (*Cladosporium fulvum*), which usually makes its appearance towards the end of the harvest period, if not before. It is chiefly for the destruction of this fungus and its spores that sulphur is burnt in the house when closed up tight during a windless evening. The sulphurous acid gas given off when burning sulphur is a powerful fungicide, and, concentrated in a closed house, it will destroy most insects with the exception of those in the soil.

The sulphur is burnt at the rate of 2 lb. for every 1,000 cubic feet of air space in the house, and to obtain good diffusion without delay it is burnt in several heaps well spaced out over the floor of the house. In preparation for this treatment the plants may be cut off a few inches above the surface of the ground and allowed to hang in the strings. When the gas has done its work and the vines are reasonably dry, ventilate the house, cut down the plants, and then carry them out with the strings and burn them. The interior of the house is then brushed down well to remove webs and dust, and washed to remove dirt and slime and improve the lighting.

Repairs to Glasshouse.

Repairs to timber and glass should then be made, followed by painting the woodwork and lime-washing the walls. Where the range of houses is extensive the work and cost may be distributed by painting certain houses each year, so that each receives a coat every second or third year. A good stone colour is most serviceable outside, and a good white-lead paint inside.

Any hot-water pipes in the upper portion of the building may be given a coat of aluminium paint or paint made of lamp black and turpentine to which a small proportion—not more than a fourth part—of linseed-oil is added. Walls of brick or concrete should be brushed down well and given a dressing of lime-wash made from quicklime in which two bottles of kerosene and 4 lb. of salt have been well stirred into the bag of lime while it is slaking. It will then neither flake nor rub off when dry.

Injuries Reduced.

As an alternative, a little cement may be added to the lime-wash and a 4 in. pot of sulphur to each bucketful. By keeping houses in good repair insects and disease have little opportunity of becoming established, and drips and leaks, which are such a common cause of injury to crops and depreciation of buildings, are avoided.

The roots of the tomato crop should be lifted, carefully examined, and carried out to be burnt when sufficiently dry. This process, together with the experience of the past season, will give a good indication of the state of the soil and its requirements. If steam sterilizing or a change of soil is not required light cultivation may be given and the land sown down in a green crop for turning under later.

If the propagating-house and potting-shed are now given a thorough overhaul as outlined above, there will then be less trouble with the young plants in this department. The stocks of soil, manure, leaf-mould, &c., which are being cured in preparation for the seed-boxes should now be turned and mixed at intervals with a view to aerating the materials and destroying insects and fungi which they may contain.

Vegetable Crops.

An important sowing during February is cabbage for spring cutting—varieties such as Flower of Spring are tender and of good quality. In warmer districts a firm cabbage such as Succession is usually sown, as they are more suited to the climate. A thin sowing of lettuce for late cutting should be made and allowed to mature without transplanting. Salad onions, radishes, spinach, silver beet, carrots, and turnips are also sowings which may be made now.

A case of black-rot disease of cabbage (*Bacterium campestre*) was observed recently. This is, as the name states, a bacterial trouble from which spraying is of little use in control. The more conspicuous symptoms are the blackening of the veins of the leaves and a brown or black ring of tissue revealed when a cross-section of the stem is examined. Ploughing-in infected stumps and other material or tossing them in a heap to decay on the head-lands are most effective ways of spreading the trouble.

As all cruciferous plants are liable to attack, this trouble may easily become serious unless care is taken. Crop rotation should be carefully observed, infected material destroyed, and care taken to see that infection is not carried from the field by men, horses, or implements. The trouble may be seed-borne, and if there is any doubt regarding the seed it should be washed in corrosive sublimate.

Manuring Small Fruits.

After the necessary pruning at this season has been done brakes of bush fruits should be given a dressing of manure and fertilizers, which should then be ploughed under. The depth of the ploughing should be carefully adjusted after consideration of what has been customary and the depth of the soil. In any case it should not exceed 6 in. at this season in established plantations.

For raspberries, red currants, and gooseberries the potash ingredient is important and should receive special consideration; the sulphate of potash is preferable for these fruits. Where farm manure is not available the land may be sown down in a cover crop for turning under about July.

Preparation of Land.

The preparation of the land for new plantations of bush fruits should be pushed ahead as soon as it is cleared of the present season's crop. A rich soil deeply cultivated and quite free from bad perennial weeds is what is required. Planting should be deferred for another season unless it is thoroughly clean, as these heavy-cropping plants will not flourish when in competition with serious weed troubles.

Every care should be taken to secure well-rooted plants of moderate size for planting out. Raspberry canes are probably the most difficult stock to buy. It is important that the canes planted should be from a young plantation, for canes taken directly from old exhausted stools are unsuitable for planting out a new field.

On arrival the plants should be carefully heeled in and then planted out permanently as soon as weather and other circumstances permit. It is best to plant chiefly the variety which has proved itself in the locality, but a few plants of other varieties in good repute may be included with a view to giving them a trial under local conditions. In raspberries, a comparatively new variety known as Lloyd George has rapidly made its way into favour in so many localities that it may be given a trial anywhere on good land.

Planting Bush Fruits.

Bush fruits are generally best planted not less than 6 ft. between rows, so that cultivation and other operations can be carried out easily, but another foot or two between rows will not be too much on heavy land with strong-growing varieties. Between plants in the row the distance may be closer; raspberry-canes are sometimes planted singly 1 ft. apart in the row, but 16 in. is close enough, and 30 in. is not too much for vigorous varieties, such as Lloyd George. Black currants may also be planted rather close in the row, 3 ft. being often quite sufficient. Gooseberries and red currants require more air.

For the first season some intercropping may be done. Cabbage, salads, potatoes, and peas may be grown as long as the welfare of the permanent crop is carefully safeguarded. Good evergreen shelter on the south side is usually required, and protection from westerly winds is sometimes a necessity. An important requirement is moisture during the summer months when the berries are being harvested. Land which dries out at that period will not carry good berry crops unless irrigation can be practised.

Planting Strawberries.

A moist soil during the summer months is a requisite for successful strawberry-culture. In a light soil which often dries out at that season the grass-grub will take many of the plants in spite of almost any economic treatment. Under almost any other conditions they crop well, and it is sometimes surprising that more are not planted. The reason doubtless is often due to the disappointing results obtained after setting out inferior or unsuitable plants. It is important the plants should be of a variety which has proved itself suited to the locality.

They must also be not only clean and healthy, but of a good fruiting strain of that variety. They must have good natural vigour—that is, not due to the use of fertilizers. The runners should be grown directly, not on old stools which are carrying a crop, but on strong young plants from which the blossoms are picked. Selected old stools with a good cropping record make excellent mother plants for building up a stock, but the vigour must be built up by giving them a rest from cropping.

Setting out the Plants.

In all but the warmest districts strawberry plants should be set out as soon as the plants are ready. The preparation of the land may usually be completed by ploughing under a liberal dressing of blood-and-bone manure, superphosphate, and sulphate of potash, and harrowing down moderately fine, followed by occasional light cultivation to destroy seedling weeds. When the land is clean and settled firmly planting may be done. This may be accomplished by drawing light furrows with a marker and planting along the lines by means of a plough, grubber, or trowel.

In exposed positions double rows are sometimes planted with a view to developing the matted-row system, but more often the single-row method is the most suitable. In warm districts, where the planting is done annually, the spacing is rather close—9 in. to 12 in. between plants and 24 in. to 27 in. between rows. Where cropping is carried on over three seasons or so, especially with vigorous varieties, 14 in. to 16 in. between plants and 30 in. or even 36 in. where horse implements are used is not too much between rows. The plants, handled carefully, should be set firmly and rather deep.

Plans for New Gardens.

It is now time to make a start in carrying out plans made for new gardens or alterations to old ones, so that lawn grass-seed may be sown during February or March and all may be ready for planting trees, shrubs, &c., towards the end of May. Established trees and shrubs which have to be cleared should be chopped off neatly at the surface of the ground, or sometimes it is an advantage to dig them out altogether.

The preparation of the land for lawns and borders is very similar to that required for other crops. That it should be thorough is important, as these crops are permanent and little more than top-dressings may be applied later. Another point requiring special attention is the grades and levels of the finished surface of the ground. There should be no haste in deciding just what they should be, nor should there be lack of care in carrying out the decisions afterwards.

These factors have much to do with the appearance of the garden, but, most important of all, by adequately disposing of all surface storm-water the health of the plants and the comfort and convenience of the inhabitants is greatly increased. In forming the drive and paths, grades and levels should receive the same consideration so that all storm-water is drained off quickly without any scouring. A little expenditure on culverts and drainage will usually be found more economical than repairing the wear on a badly-drained road surface.

Consolidations.

When the formation work is completed it should be given time to consolidate, and in about a fortnight, when seeds near the surface have had time to germinate, it should be lightly hoed in fine weather.

(Continued on page 78.)

Work for the Month in the Apiary.

Returning Swarms to Parent Hives.

SWARMS in January are of little value except as increase for the next season, and should be returned to the hives from which they originated if these can be traced. It is a good plan to kill the old queen in the swarm when returning it, at the same time destroying all but two queen-cells in the parent colony. If the hive is cramped an extra super may be given, and with this inducement the colony will usually settle down to work at once.

After-swarms should always be returned to the parent hive. They are easily disposed of, even if the beekeeper does not know from whence they came. If they are shaken through an excluder into an empty super the virgin queen or queens can easily be picked out as they attempt to force their way through, and once these are removed the bees will return to their old home. The young queens can then be used to replace poor queens in the apiary.

It is an excellent plan to have one or two queen-cages always on hand. The young queens can each be confined in a separate cage, and when the queen to be destroyed is removed the closed cage containing the virgin can be placed on top of the frames and left there for twenty-four hours, during which time she will be fed by the bees in the hive. At the end of twenty-four hours she can be released and allowed to run down into the frames, when she will be accepted by the bees.

Ventilation.

The ventilation of the hives should by now be receiving every attention. Every means should be used to ensure the bees having an abundance of fresh air day and night. All weeds and other obstructions should be removed from the fronts of the hives, and the entrances enlarged as much as possible. In extreme cases the hive-bodies should be raised from the bottom-boards by means of small blocks of wood. On no account should the bees be allowed to cluster outside the hives, and wherever they show a tendency to excessive fanning steps should be at once taken to increase the supply of fresh air to the colonies.

Supers.

One of the necessities of a well-regulated apiary is an abundance of supers when the honey-flow is in full swing. Every inducement should be given the bees during the often brief season to gather in every available drop of nectar. No beekeeper with business acumen will allow his bees to loaf or cluster outside the hives for lack of storage room. It is well when adding extra supers to place them between the brood-chamber and the first super, or at least raise a few frames of honey from the first super into the second when adding the latter.

It should be understood, however, that supering must not be overdone and the bees disheartened by being given too much work at one time. On no account add a second super until the bees are well at work in the first, and in cases where the colonies are only building up well at the beginning of the honey-flow—that is, where a poor colony has been requeened and the new queen's brood has not, as yet, hatched—it is an excellent plan to tier up with half-stories. Many an apiarist has had a moderate return from a small colony with half-stories when it is doubtful whether any return would have been obtained by the use of full-depth supers.

Queen-excluders.

January is the month when queen-excluders are of most use, especially in southern districts. Whatever their disadvantages may be in some localities, in the south they have proved their efficacy in enabling extracting to be finished before the hot weather goes, without the destruction of any brood whatever. Excluders should never be used for general purposes until the main honey-flow is in full swing. By that time the bees are used to working in the supers, and with nectar in abundance to be had all around them they will work cheerfully right through the hive, passing through the holes in the excluders as if no obstruction existed.

The best method of using the excluders is as follows: All sealed brood should be raised above the excluder and the queens confined below on drawn-out combs. The brood above the excluder should be watched for a few days in case any eggs have been elevated, as the bees will sometimes attempt to raise queen-cells above the excluder. If this happens the queen-cells should be destroyed, as the queens which would emerge from them would not be able to pass through the excluders

VEGETABLES, SMALL FRUITS, AND FLOWERS.

(Continued from page 77.)

If this is done once or twice the land will be clean and firm, which are the conditions necessary for a good strike of grass-seeds. When the final adjustments to the surface have been completed by alternate raking and rolling grass-seed should be sown during a windless period at a rate of about 1 oz. to the square yard, immediately following with a mixture of superphosphate and sulphate of ammonia in equal quantities at the same rate.

Seeds and fertilizers are then raked in smoothly, and nothing more is required until the grass has grown an inch or so long, when a light roller should be used.

If this work cannot be done during the time mentioned it should be deferred until about August. In the drier localities these periods are of special importance, but in more humid districts more liberties may be taken in that respect.

Most varieties of garden hedges in good condition may be trimmed with advantage during February, when they will retain their appearance for a maximum period. Hedges which have been neglected and require heavy cutting are generally best dealt with in early spring.

—*Wm. C. Hyde, Horticulturist, Wellington.*

to get mated, and would in time develop into drone-layers. By providing the queen with plenty of empty combs she will be able to cultivate laying at a sufficient rate to keep up a supply of workers, and as the brood hatches out in the upper stories the cells will be at once filled with honey.

Excluders are often condemned as being productive of over-swarming, but in many localities swarming ceases automatically as soon as the honey-flow commences, and if the queen is allowed plenty of room in the brood-chamber and the brood in the supers carefully watched for the production of queen-cells very little harm can come from the use of excluders, while the immense advantage of being able to extract combs entirely free of brood is worth a great deal to the apiarist at his busiest season.

—E. A. Earp, Senior Apiary Instructor, Wellington.

Paraffin Wax for Preserving Hive Parts.

BEEKEEPERS are aware that unless hive bodies are protected from the weather with paint or other means the depreciation becomes expensive. Supers need painting every few years, which takes time and is a costly business.

Dipping supers in boiling paraffin wax instead of painting has now been tried out for a number of years and has proved to be quite efficacious. It is less costly than painting, and takes considerably less time.

Bulk refined paraffin wax is sold in New Zealand in two grades with different melting-points, one at 127° F. to 130° F., and the other 150° F. Either wax is quite suitable. This wax is sold in bulk at about 3½d. per pound. One super will absorb just under 1 lb. of wax, which is equal to two coats of paint and lasts as long.

Method of Dipping.

The method of dipping usually adopted is to obtain a shallow tank about 4 ft. by 3 ft. by 1 ft. deep. This tank is better seamed or riveted at the corners; if soldered, the heat will sometimes cause the solder to melt. The tank can be stood on bricks and heated with primus stoves, or a rough fireplace can be constructed, as illustrated. This fireplace should be built well away from any buildings, and a tin or two of dry sand or earth should be kept handy to spread should the wax happen to be spilt and catch fire.

Place sufficient wax in the tank so that, when melted, there will be 4 in. to 6 in. of liquid wax. Light the fire under the tank, and when the wax is boiling dip a super, gradually turning it round so that each side is immersed for fifteen to twenty seconds. The illustration shows the method of operation.

One man should place the super in the tank and turn it, and his assistant should remove it with a pair of tongs, holding it for a short while on the tray to allow any surplus wax to run off. Some beekeepers stand the hot supers on boards covered with fine sand in order that the supers may grip when added to a hive, but this is quite unnecessary.

Showing the method of dipping a super in a tin of boiling paraffin wax.

Treating Bottom Boards.

Bottom boards may, with advantage, be treated in the same way as supers, except that they are immersed in one operation. All woodwork, supers, or bottom boards must be thoroughly dry before being dipped. They are ready for use within half an hour of being treated.

If appearance is a desirable feature the supers may first receive one coat of paint, and when this is quite dry, they may be waxed. They will then last for many years. On the other hand, they may first be waxed, and after several years they will still take a coat of paint.

One of the advantages of dipping is that the wax penetrates the pores of the wood and all cracks and joints, and seals the end grain of the wood. Hot weather does not make the wax run, but the heat assists to drive the wax into the wood. There are many hundreds of supers dipped in boiling wax in use in New Zealand apiaries.

—D. S. Robinson, Apiary Instructor, Dunedin.

Examination for Chick-sexing.

AT a chick-sexing examination held recently in Auckland, Mr. D. E. Hopkins sexed 200 chickens in 24 minutes 30 seconds, with an accuracy of 93 per cent., thereby qualifying for a renewal of his second-class certificate.

Poultry-keeping Section.

Internal Parasites.

SOME years ago, when poultry were kept in more or less small flocks and in separate yards, the incidence of worm or parasitic infestation was not considered to be of sufficient danger to call for very much consideration, but since the introduction of modern methods and a more intensive system of poultry-keeping worm-infestation has caused some poultry-keepers much thought, and in some cases heavy losses have been experienced from this trouble.

No poultry-farmer can now afford to regard the presence of intestinal worms as of little importance, for failure to adopt suitable preventive measures will, sooner or later, lead to poorer returns and a higher death-rate among his flock.

Poultry are susceptible to infestation with several varieties of worms, which may infest the throat, wind-pipe, gizzard, or intestines, and most of these are, if in any number, capable of seriously affecting the general health and productivity of the poultry. Dr. Salmon describes more than forty kinds of parasitic worms that may infest fowls, ducks, geese, and turkeys.

Under ordinary good conditions a few worms do not seem to do much harm, and, in fact, few birds are found to be quite free from some intestinal worms. It has been found that in localities where poultry are allowed access to pig-sties they are more likely to become infested with parasites.

Types.

Internal parasites may be divided into two chief types—namely, tapeworms and roundworms. Tapeworms are flat, tape-like, and segmented, while roundworms are unsegmented, round, pointed at each end, and are usually greyish-white in colour. Both these types vary greatly in size.

Round Worms.

Different varieties of round worms are found in either the intestines or ceaca of almost all birds, and they are more common than tapeworms. They vary greatly in length, and at times are found up to 4 in. long.

Life-history.—The eggs, which are so small that they cannot be seen with the naked eye, are deposited by the female worm in the intestines, and are passed out in the droppings. Under favourable conditions of moisture and warmth small worms develop within the eggs in from ten to sixteen days, and, if eaten by a susceptible fowl, the young worm is hatched. A period of from fifty to sixty days is required for young worms to reach maturity, and the females are capable of laying eggs and starting the cycle over again.

Fig. 1.—A section of the intestine of a fowl, showing round-worms protruding from a cut end.

[Photo by courtesy California Agricultural Experiment Station.

Tapeworms.

As previously mentioned, tapeworms are flat, segmented, and white, and vary greatly in size from those that can hardly be seen by the naked eye to some up to several inches long.

Life-history.—The tapeworms attach themselves to the lining of the intestines by means of suckers, with which their heads are equipped. New segments continue to form just behind the head. As the tapeworm grows the end sections or segments, which contain fertilized eggs, are detached and passed out in the droppings of the fowl, and may be eaten by flies, worms, snails, or beetles which act as intermediate hosts in which the eggs develop to the infectious stage. When these insects are taken into the body of the fowl the young tapeworms are freed and develop to maturity.

Conditions Produced.

The symptoms of worm-infestation are not very characteristic, especially with adult birds. With young birds there is usually a general unthriftiness and stunted growth.

At times indications of worms are seen when birds stretch their necks and make a screeching noise similar to a sea-gull, while other symptoms are poor condition, loose and ruffled feathers, comb and face pale, with frequent yawning. The appetite is sometimes increased, and the droppings are thin and contain much yellow slime. However, the best method for the poultry-keeper is to kill a sick bird when he suspects worms, and to cut open the intestine from the gizzard down and look for the worms. This is really the only certain way to diagnose the trouble.

Treatment.

While it is generally considered that the most effective treatment for the removal of worms is to treat birds individually, this is not always practical, especially when large flocks are concerned.

The following flock or mass treatment is recommended: Firstly, starve the birds for twenty-four hours, then give nicotine sulphate and salts. For each hundred adult birds to be treated take one liquid ounce of nicotine sulphate, and

½ lb. of salts. Dissolve and stir these in the water with which the mash is to be mixed. Sufficient mash should be mixed so that each bird will get about 1 oz. of mash.

It is important to ensure that feed troughs are of sufficient length to enable all birds in the flock to feed at once in comfort. It must be clearly understood that nicotine sulphate is poisonous, and that on no account must the dose stated be increased; otherwise fatal results may follow. In some cases for a few minutes after eating the mash the birds will lose the power of their legs and will give indications that they are likely to succumb under the treatment. This will be of short duration, provided that the amount of nicotine sulphate given is not in excess of the quantity stated.

Treated birds should be confined to the house for at least twenty-four hours after treatment, and care should be taken to clean the house thoroughly and remove all litter and droppings. It is a good plan to place wire-netting over and in front of the perches so that the birds cannot pick among the droppings after being treated.

Another method of treatment is to mix one teaspoonful of spirits of turpentine and one tablespoonful of olive-oil with the mash for each ten adult birds. This should also be given after the birds have been starved for twenty-four hours. It is well to give this treatment in the evening.

Where only a few birds have to be treated, worm medicine recommended for children may be given. Generally speaking, when giving medicine to poultry it is considered that a dose for an adult fowl would be about one-third of the quantity that would be given to a child of about twelve years old.

Fig. 2.—The inside of a hen's intestine showing attached tapeworms.

[Photo by courtesy California Agricultural Experiment Station.

Prevention.

The value of the individual fowl is such that it seldom pays to spend time and money in trying to cure sick birds, but treatment for internal parasites is a different matter. However, prevention rather than cure should be the policy of all poultry-keepers.

The following suggestions should be given due consideration. If birds are allowed to run in yards each house should be equipped with two yards; while one is in use the other should be ploughed or dug up and sweetened. Each yard should be given a good dressing of lime every year, about 1 lb. to each square yard. All fowl-houses should have concrete floors; this enables a thorough cleaning and disinfecting.

If droppings' boards are used they should be cleaned at least twice a week and the droppings placed well out of reach of the birds. Nothing is more likely to cause an epidemic of worm-infestation than allowing fowls access to manure heaps. If fowl-manure is spread over the ground it is advisable not to allow poultry to graze on that area for at least twelve months.

Young Stock.

It is a wise policy to always rear young stock on fresh, sweet ground. They are more susceptible to worm-infestation, and are likely to be more seriously affected by those parasites. It is never safe to run young stock on stale or tainted ground.

Worms are passed from one bird to another through the droppings. The worms, or their eggs, are expelled by one bird and picked up with food or water by others. Care should be taken to drain yards well, and to fill in any low, damp places, and if possible prevent birds from drinking from stagnant pools.

Feed-troughs and drinking-vessels should be kept clean and be so arranged that the birds will not soil them.

The best way to avoid an epidemic of worm-infestation is to adopt, and strictly adhere to, a real sanitation programme. If this is not done, sooner or later the poultry-keeper will probably have to pay for any neglect.

—C. J. C. Cussen, Chief Poultry Instructor, Wellington.

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N.Z. Federation of Young Farmers' Clubs.

Edited by S. Freeman, Dominion Organizing Secretary.

Manawatu Club's Well-attended Field-day.

D. S. ROBINSON, District Secretary, Palmerston North.

ECLIPSING even the field-day recently held at Levin by the Southern Manawatu Young Farmers' Clubs, a comprehensive series of demonstrations held at Mr. E. W. Barnett's farm, Tokorangi, on 12th October, drew an attendance of more than two hundred and fifty members of the farming community.

A more perfect setting could not have been obtained, and the visitors enjoyed the first real summer day of the year. A ring was set up in which the demonstrators were able to give every one a clear view of the animals they were discussing.

Mr. H. J. Lancaster, chairman of the Manawatu District Committee, introduced the various speakers, and replies of thanks were made by representatives of the clubs present.

The day opened with a Clydesdale horse demonstration by Mr. H. E. Hocken, of Colyton. To keep up the interest throughout the day, individual demonstrations were short and to the point, half an hour being allowed for each. Following Mr. Hocken, Mr. A. Wheeler, of Marton, gave a demonstration on Romneys, and Mr. T. Ranford, of Whakarongo, on Jerseys. The handling and drafting of fat lambs was dealt with by Mr. K. Deighton, of Marton.

Fig. 1.—A demonstration on Polled Hereford cattle by Mr. E. W. Barnett.

Fig. 2.—A comprehensive view of the large number who attended the field day. A lecture on mole drainage is being given by Mr. C. J. Hamblyn.

A light lunch, consisting of pies and sandwiches, was served by the Halcombe branch of the Women's Division, and much of the credit for the success of the day must go to them.

Mr. C. Swift, of Woodville, opened the afternoon programme with a demonstration on Southdowns, and Mr. E. W. Barnett then demonstrated on his Polled Hereford cattle. Mr. C. J. Hamblyn, Fields Superintendent, Department of Agriculture, followed with a practical demonstration on mole drainage. Various methods were illustrated and the advantages and disadvantages pointed out.

(Continued on next page.)

Members of the Wellington Council taken at Palmerston North. Back row (left to right): V. C. Lewis, N. Martin, A. Johnson, K. W. Cooper, D. McGregor, F. E. Sherwood (Council Secretary), T. P. Blyth, G. N. Buchanan, C. B. Anderson, A. B. Marshall, E. Gane, R. G. Montgomery. Front row (left to right): C. J. Hamblyn (Fields Superintendent), J. N. Blyde, H. I. Forde (Editor), W. F. McLaren (Past Pres. N.Z. Fed.), W. James (Council Vice-Chairman), H. M. Linklater (Council Chairman), S. Freeman (Dominion Org. Sec.), J. H. Bremner, G. D. Tod, J. B. Chrystall, E. W. Garnett, T. Darke.

Wellington Y.F.C. Council Meeting.

OUTSTANDING progress in the Wellington Council area was revealed in the report of the Hon. Secretary, Mr. F. E. Sherwood, Department of Agriculture, at the meeting of the Council in Palmerston North recently. The Chairman, Mr. H. Linklater, presided, and there were about thirty delegates present, the eight District Committees being represented.

"From personal observation and discussions I have had with various persons there would appear to be several points worthy of inclusion in our activities and several items which could be more easily improved at this stage of our membership than when we have ten thousand or more members throughout the Dominion," said Mr. Sherwood. "This movement is such a splendid one that I feel we should do everything in our power now to build up club tradition for the future.

Expansion of Activities.

"Such things as encouraging correct procedure at meetings, the correct keeping of papers, books, photos, &c., so that clubs may keep permanent records of their activities, the encouraging of clubs to acquire their own club-rooms, &c., and thus help towards making our organization a permanent one—these points all merit our attention at this juncture. No doubt a good deal could be accomplished if a series of articles on club administration and procedure, &c., were included in our Y.F.C. notes in the *Journal*.

"I have heard comments about our badge and the badge on our blazers, and there would certainly appear to be room for considerable improvement. While on the subject of badges and blazers, I feel that we should encourage more to wear these at club meetings and functions. The possibility of winners of National Y.F.C. championships being awarded blazers is well worth considering.

"Several persons have spoken to me on the subject of making our Y.F.C. members realize more fully the privilege of belonging to the movement. Several suggestions have come forward, such as an initiation ceremony for new members, an oath of allegiance to the movement at large Y.F.C. gatherings, and a short ceremony at the commencement of each club meeting. Perhaps the movement could have its own song, and why not a motto? Possibly considerable interest could be aroused by conducting competitions among club members on the various points I have raised.

Imparting Information.

"It has also occurred to me that we are not making enough use of opportunities to impart information, and I feel that we should encourage the invitation of other members of the farming community to lectures, &c.

"In conclusion, it is indeed pleasing to note the greater interest that the general public is beginning to show towards the Y.F.C. movement. Everywhere one notes a greater appreciation of the vital part that our organization is going to take in the future agricultural history of our country, and it can be confidently stated that the Y.F.C. movement is definitely coming into its own."

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Manawatu Club's Field-day.

(Continued from previous page.)

He was followed by Mr. E. E. Elphick, Department of Agriculture, who gave a post-mortem on both a cow and a sheep. Animals with symptoms of disease were selected and killed, and a most interesting demonstration on diseases and anatomy was given by Mr. Elphick.

The day concluded with afternoon tea and a vote of thanks to the ladies who had assisted.

Importance of Herd-management.

A. E. WEBB, Mangatawhiri Club, Auckland.

AS a Herd-testing Officer I am placed in the position of being able to observe and study many different angles of farming and to draw my own conclusions as to the efficacy and economy of the many methods under practice. Being a believer in originality of ideas, I endeavour to make those conclusions definitely my own without allowing my thinking to be unduly influenced by the method and opinions of others as expressed in many farming papers.

As a member of the Y.F.C. movement, I would like to place my views on the subject of herd-management before other members for their consideration and criticism. It must be realized, however, that I do not attempt to dogmatize on the subject, and that I merely review the situation as it appears to me.

Attitude towards Herd and Shed.

In the first place, I wonder how many dairy-farmers look upon their cow-sheds as the place in which they carry out their business and produce their income? To many it is only "the shed," a place in which the cows are milked. A good shopkeeper or business man regards his shop, garage, office, &c., as his place of business, and makes it as attractive and convenient as possible. This is only efficiency, and I consider that dairy-farmers would be wise to adopt this attitude towards their cow-sheds.

It is a well-known fact to most of us that a great deal of our time is spent in the cow-shed. Fortunately, with more modern and compact machinery, tighter regulations, and improved planning, sheds are gradually becoming better. It is also a deplorable fact that the herd is regarded, generally, as a mob of cows that have to be pushed through the shed as quickly as possible in order that other work may be done. This, to my mind, is entirely wrong. The herd is a very valuable asset, and is also the source of the farmer's income. For these reasons alone it should be given the greatest possible thought, care, and attention.

In the past, time has been a big factor; farmers found that "breaking in" and development work occupied their attention to the partial or greater exclusion of the herd. Now, however, such a high standard of grading is demanded, diseases are of such an increasing importance, and efficiency of production is so necessary for economical farming that farmers would do well to place their herds first.

Herd-testing.

Being a herd-tester by occupation, I have, perhaps, a bias in favour of the practice of herd-testing. In spite of this, however, I am quite safe in saying that testing has become a well-established feature of modern, progressive, and businesslike farming, and that nearly all farmers recognize its value and necessity. There are still a few that fail to do so, but in their case I am quite sure that it is only conservatism that prevents them from adopting it and not any fault of testing.

I do not propose to deal at length with herd-testing, as I consider it is well enough known. Nevertheless, as a factor in herd-management it is probably paramount, and for that reason must be placed first. Three things are necessary to obtain the most benefit from testing. The first is the culling of the poor cows in the herd; the second, the buying and regular use of good and well-backed bulls; and the third, breeding all replacements on the farm from the best among the cows.

I admit there are difficulties in all these things, but their importance is not in any way diminished by that fact. It is true that one may be unlucky in a choice of bulls, and it is also true that the best cows do not always produce good heifers, but as regular practices these two things, if followed, must react to the advantage of the herd. It is true, again, that culling for low production is very much hampered by the culling that is forced by diseases, but the control of diseases is

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also part of herd-management and can be worked in conjunction with culling for low production.

Mastitis-control.

For years the problem of mastitis has been the bugbear of all dairy-farmers, but recently it has been realized that a cure is a matter for a great deal of research—if one is ever discovered. Most good can be achieved for more or less immediate results by mastitis-control. This is now within reach of all dairy-farmers either through the Department of Agriculture or their own herd-testing organization.

Some very valuable spade work has been done by the Department of Agriculture with the "leucocyte count" test both at Wallaceville and Hamilton, and many farmers have greatly benefited by it. Dr. Hucker, of New York State, strongly advocated the universal adoption of the "brom thymol blue" test for mastitis, and this has been adopted by the Dairy Board as a farm test. Its great virtue lies in the fact of its simplicity. Although not so accurate as the "leucocyte count" test it is nevertheless sufficiently so to be of valuable assistance to the farmer.

Wanganui District Y.F.C. Field-day.

A. R. DINGWALL, District Secretary, Wanganui.

ARRANGED by the Wanganui District Y.F.C. Committee, a successful field-day was held on the racecourse, Marton, on Friday, 21st October, consisting mainly of stock-judging and demonstrations.

The prize-winners in the respective judging competitions were as follows:—

Southdowns (Judge: Mr. C. E. Vile, Bulls).—L. McLeay (Marton), A. Stewart (Bunnythorpe), and H. Gower (Marton) tied for first place with 95 points each out of a possible 120 points.

Dairy Cattle (Judge: Mr. H. J. Lancaster, Glen Oroua).—C. B. Anderson (Bulls), 89 points, 1; A. Marshall (Marton), 88 points, 2; G. Gower (Marton), 83 points, 3. Possible, 100 points.

Romneys (Judge: Mr. A. L. Wheeler, Marton).—F. Dawes (Westmere), 75 points, 1; J. Henderson (Marton), 65 points, 2; F. Brice (Marton) and R. Shields (Marton) tied for third with 55 points each.

Beef Cattle (Judge: Mr. A. L. Wheeler, Marton).—A. Stewart (Bunnythorpe), 65 points, 1. L. McLeay (Marton) and R. Shields (Marton) tied for second with 60 points each.

Pigs (Judge: Mr. Neilsen, Palmerston North).—C. B. Anderson (Bulls), 62 points, 1; T. S. Smith (Marton), 40 points, 2; H. Marshall (Marton), 3.

Competition was keen, and the number of entries received for the various classes was as follows: Southdowns, 15; dairy cattle, 17; Romneys, 13; beef cattle, 8; pigs, 5.

A time-limit of one hour was allotted to each class, the first twenty minutes being devoted to the judging competition and the remainder of the time to a demonstration by the judge in each case. The demonstrations were most interesting and instructive, and were followed with keen attention by those present.

At the conclusion of the field-day Mr. Brice, of Marton, complimented the club members on the interest they had shown in both the competitions and the demonstrations.

Stock for the various classes were kindly loaned as follows: Mr. C. E. Viles (Bulls), three Southdown ewe hoggets; Mr. W. Davidson (Rongotea), three baconer pigs; Mr. J. Brice (Marton), three Hereford bulls; Mr. G. Marshall (Turakina), four Romney ewe hoggets; Mr. Lex Cameron (Turakina), three Jersey cows.

The arrangements for the field-day were carried out by a special committee consisting of Mr. A. B. Marshall (Marton), chairman, and Messrs. V. F. Toulmin (Hunterville) Advisory President, C. B. Anderson (Bulls), L. McLeay (Marton), and R. Shield (Marton).

Bay of Plenty Debating Contest.

C. R. TAYLOR, District Secretary, Whakatane.

THE final debate between the premier teams of the Western and Eastern zones of the Bay of Plenty Young Farmers' Clubs to decide the shield-holders for 1938 was held in the Thornton Hall before an enthusiastic audience of more than one hundred and fifty supporters of the movement, many of whom had travelled from beyond Waimana in the east and Tauranga in the west.

Mr. R. Reid (a member of the Te Puke Club) presided, and welcomed those present. He extended special thanks to Mr. Mead, of Taneatua, who had consented to act as judge.

Mr. W. A. McCracken, of Edgecumbe, Chairman of the Eastern Bay of Plenty Committee, outlined the aims and objects of the Y.F.C. movement, and concluded by urging all farmers and other well-wishers to get solidly behind the organization and give it all possible support for the sake of the young men who were destined to become New Zealand's primary producers in the near future. He made a special appeal to farmers to do their best to persuade young men employed by them to join up with the clubs, and pointed out that not only would they thus be helping a very worthy cause, but they would also be benefiting themselves by reason of the keener interest these young men would take in farming activities.

The subject for debate was "That Modern Civilization is a Failure." The Waimana Club was represented by R.

Woolfield (leader), R. White, L. Macdonald, and H. White, who took the affirmative. The Paengaroa team, which took the negative, consisted of A. Walter (leader), E. Pinker, V. Benner, and P. Hickson. The debate was spiritedly contested, and occupied close on two hours. The decision was awarded to the Waimana team by 81 points to 69.

Commenting on the debate, the judge, Mr. Mead, said that the debating ability displayed by the teams and by individual members was of a very high standard and had improved considerably since he had first become interested in this phase of the Y.F.C. movement. He briefly touched upon the efforts of each speaker, pointing out just how points had been gained or lost. The speakers gaining the highest points for the respective sides were L. Macdonald (Waimana), 23 points, and E. Pinker (Paengaroa), 21 points, out of a possible of 25.

Mr. D. S. Ross, Chairman of the Auckland Y.F.C. Council, congratulated the teams upon the able manner in which they had handled the debate, and presented the trophy to the Waimana team as holders for the year. R. Woolfield, the leader of the winning team, suitably replied.

Supper was served by the ladies of the district, for which due appreciation was shown. Dancing and other items of entertainment brought an enjoyable and educational evening to a close.

Matarau Club's Entertainment.

I. D. BODLE, Hon. Secretary, Matarau Club.

A FULL and appreciative meeting of members of the Matarau Young Farmers' Club saw the screening of a film illustrating the manufacture of superphosphate at the home of Mr. and Mrs. A. O. Brown, Ngararatunua, on 12th October.

The film vividly showed the primitive struggle of a nomadic people moving their herds from the worn, bare pastures to new grounds. Their journey in search of grass was a bitter battle with the elements. This realistic drama of unscientific primitive man, faced by starvation and drought, surmounting the impregnable, primeval barriers of rock ranges and swollen rivers, makes young farmers of to-day realize the value of fertilizers which preserve and increase the fertility of their lands so that their pastures are made permanent and productive.

A clear description was seen of the manufacture of superphosphate, which is one of the principal fertilizers used in New Zealand. The works shown at Otahuhu are the largest in the Southern Hemisphere. Views were also shown of Nauru Island, and its working and remarkable loading facilities—in water too deep for boats to anchor or wharves to be built, large cargo vessels are loaded in eight hours. Another flash showed the sulphur workings in Mexico, the source of that other essential ingredient which is another cog in this manufacturing of plant food.

Mr. A. Rushbrook, on behalf of the club, thanked Mr. Wood-year Smith for his instructive lecture and explicit description of the industry. The club's chairman, Mr. H. G. Agnew, thanked Mr. and Mrs. Brown for their hospitality and the enjoyable supper they provided, which had made the concluding evening of the winter lectures such a success.

A flashlight photograph of part of the gathering at the film evening held by the Matarau Club.

At the conclusion of the screening a member of the Whangarei staff of the Department of Agriculture took a flashlight photo of the gathering.

By attending to the social side the interest of members will be maintained and the educational activities made more interesting. The co-operation of the parties interested in the progress of the movement plays a most important part in the advancement of club activities, and we are grateful to those who have come forward with assistance.

Y.F.C. Camp at Hastings.

ADVICE of the Y.F.C. camp at Hastings has been received from Mr. W. G. Brownlie, Chairman of the Northern Hawke's Bay District Committee.

"The joint Northern and Southern Hawke's Bay District Committees have decided to hold the Educational Week at Hastings commencing on Monday, 8th May, and continuing until Saturday, 13th May," he writes. "It was decided to limit the number attending the camp to 250, as it is considered that any more would merely hamper the organization.

"Full particulars will be announced at the end of January, and clubs will be circularized. Clubs and district committees are asked to note the date—8th to 13th May.

Among the Clubs: Reports on Activities.

At the request of a number of members the name and address of the club secretary is included in this section beside the name of each club. It is considered that this information will be of value, as it will encourage secretaries to correspond with one another on club matters, &c., and will also assist prospective members and others to make contact with clubs in the various districts. The names of the District Secretaries are also indicated.

A number of clubs are at present in recess because of seasonal farming activities, and consequently their secretaries have no news to report. This applies particularly to the South Island, where harvesting and other operations make it necessary for clubs to close down during the summer months. The same applies, in a lesser degree, to clubs in the North Island, many of which close down for one to two months because of haymaking, shearing, &c.

Western Southland.

(District Secretary: A. Stuart, Department of Agriculture, Invercargill.)

Dipton (Secretary: J. R. Palmer, Dipton).—Lecture by Mr. A. Douglas, Inspector of Stock. Lumsden, on "Pulpy Kidney in Lambs and Ante-partum Paralysis in Ewes."

Lochiel (Secretary: A. R. Forbes, Otahuti R.D., Invercargill).

Thornbury (Secretary: G. O. Fallon, Section 4, Wright's Bush R.D., Invercargill).—Practical demonstration by Mr. D. Marshall Invercargill, on "Judging Romney and Southdown Hoggets."

Woodlands (Secretary: S. J. Hargest, Rakauhaka, Invercargill).

Wyndham (Secretary: J. Winter, Florence Street, Wyndham).

Eastern Southland.

(District Secretary: W. Faithful, Department of Agriculture, Gore).

Crookston (Secretary: D. Rea, Crookston).

Moa Flat (Secretary: L. Sutton, Moa Flat).

Otama (Secretary: C. C. Dickson, Box 35, Gore).—Discussion on Y.F.C. Scholarship to Lincoln College. Address by Mr. G. P. Cross, of Gore, on "Travel Abroad." Mr. Cross gave an excellent description of his recent extended tour of Great Britain and other European countries.

Waikaka (Secretary: W. Kerse, Box 1, Waikaka).

South Otago.

(District Secretary: A. F. Greenall, Department of Agriculture, Balclutha.)

Clinton (Secretary: F. G. Corbett, Ashley Downs R.D., Clinton).—Address by Mr. Judson on "Farming in North Auckland."

Lawrence (Secretary: W. McNoe, Waitahuna).

Milton (Secretary: D. Tweedie, care of Mr. D. Clarke, sen., Moneymore, Milton).

Stirling (Secretary: Ron Anderson, Box 19, Stirling).—Lantern lecture by Mr. D. S. Robinson, Apiary Instructor, Department of Agriculture, on "Beekeeping." At the previous meeting, Mr. F. L. Nicholson, who recently returned from overseas, gave a very interesting talk on his travels, illustrated by moving films. During his address he dealt with the Smithfield Meat-market and the Armour headquarters in United States of America.

Central Otago.

(District Secretary: G. G. Calder, Department of Agriculture, Alexandra.)

Alexandra (Secretary: Peter Weaver, Earnscleugh, Alexandra).—Debate with the Alexandra Junior Homemakers' Club, the subject being "Is Twenty-one too Young for a Girl to Marry?" Contending that women were too young to marry at twenty-one, Miss Hardy and Miss Weaver led the Junior Home-makers' Club, and W. Cummock and E. Weaver advanced the opposite view for the Young Farmers' Club. Unfortunately, the Alexandra Y.F.C. Chairman (L. Kinnaird), who would have been one of the leaders, was taken to hospital the previous day suffering from appendicitis. The judge, Mr. G. G. Calder, Department of Agriculture, decided in favour of the Junior Home-makers' Club, and in summing up gave some useful hints on debating. Mrs. W. Bodkin, who took the chair for the evening, also brought before the members some interesting points in the art of debating. The Junior Home-makers' Club members served a very enjoyable supper. The holding of a combined J.H.M.C. and Y.F.C. ball was discussed and arrangements were finally left in the hands of a committee.

Arrowtown (Secretary: C. B. Anderson, R.D., Gibbston, Arrowtown).

Manukerikia (Secretary: D. Armitage, Lauder R.D., Becks).

Roxburgh (Secretary: E. J. Dunlay, Roxburgh East).—Address by Mr. S. R. Whyte, Hon. Secretary, Otago-Southland Council, on "The Liability of the Farmer in Respect to Accidents to his Employees." Mr. Whyte also exhibited some interesting and humorous films.

Upper Clutha (Secretary: W. A. Kane, Box 5, Hawea Flat).

Dunedin.

(District Secretary: S. H. Saxby, Department of Agriculture, Dunedin.)

Middlemarch (Secretary: James Howell "Stonehurst," Middlemarch).

Palmerston (Secretary: I. T. Smith, Bushey Road, Palmerston South).

South Taieri (Secretary: G. A. Graham, jun., Maungatua R.D., Outram, Dunedin).—Report of District Committee meeting discussed. Decided to approach West Taieri Club regarding a ploughing match to be run by the combined clubs. All members present signified their intentions to enter for the Y.F.C. stock-judging competitions at the Dunedin and Taieri Shows; one member to compete in the blade-shearing contest at the Dunedin Show.

Waikouaiti (Secretary: S. Heckler, Waikouaiti).

West Taieri (Secretary: John Young, jun., "Brantsfield," Allanton).

North Otago.

(District Secretary: T. A. Sellwood, Department of Agriculture, Oamaru.)

Duntroon (Secretary: A. Francis, Duntroon).

Enfield (Secretary: J. Porteous, care of Mrs. W. Malcolm, Enfield R.D., Oamaru).

Five Forks (Secretary: W. J. Kingan, "Black Cap," 15D R.D., Oamaru).

Hampden (Secretary: R. Douthwaite, Post-office, Hampden).

Papakaio (Secretary: L. D. Gray, Papakaio).

Tokorahi (Secretary: Ken. Cook, Livingstone, Otago).

Upper Waitaki (Secretary: J. H. McCaw, "Cliffside," Hakataramea.)

Waitaki-Hilderthorpe (Secretary: W. R. Paton, Pukeuri, Oamaru.)

South Canterbury.

(District Secretary: C. C. Leitch, Department of Agriculture, Timaru.)

Albury (Secretary: S. Askin, Mount Nessing, Albury).

Arno (Secretary: R. P. Lindsay, Waikakohi R.M.D., Waimate).

Cannington-Cave (Secretary: R. McKenzie, Cave, Timaru).

Fairlie (Secretary: B. J. O'Neill, Allandale, Fairlie).

Geraldine (Secretary: R. L. Volckman, Te Moana, Geraldine).

Hunter (Acting-Secretary: E. R. McConnell, Hunter R.M.D., Waimate).

Maungati (Secretary: J. F. Collie, Otaio Gorge, Maungati R.M.D., Timaru).

Milford (Secretary: Geo. Crossman, Milford, via Temuka).—Minutes of District Committee meeting. Arrangements for turnip-hoeing competition; sub-committee set up, consisting of J. Woodhead, A. Johnson, and A. D. Crossman, to appoint judges, fix date, and draw-up conditions. Discussion on Farmers' Union trip to Lincoln College. Report by the Secretary on the South Canterbury Y.F.C. tour of the North Island.

Morven (Secretary: L. Paul, Waikakahi R.D., Waimate).

Pleasant Point (Secretary A. D. Talbot, Pleasant Point).—Report by delegates on District Committee meeting. Members who took part in the South Canterbury Y.F.C. tour of the North Island gave their impressions of the trip. Address by Major Lee on "The New Zealand Territorial Force."

Southburn-Lyalldale (Secretary: R. Gray, St. Andrews, Timaru).—Discussion *re* oat and wheat stacking competition. Mr. R. Gray (Advisory President) reported on the District Committee meeting. Reports on the South Canterbury Y.F.C. tour of the North Island were given by K. Bishop and E. Parry, both of whom took part in the tour.

Waihaorunga (Secretary: W. B. Armstrong, Pentland Hills R.D., Waimate).

Mid-Canterbury.

(District Secretary: V. P. Boot, Department of Agriculture, Ashburton.)

Ashburton (Secretary: J. J. Burrows, Chertsey Ashburton).

Hinds (Secretary: D. G. Tait, Ashburton-Lowcliffe R.D.).

Mayfield (Secretary: W. Lo,an Doyle, Mayfield R.D., Ashburton).

Methven (Secretary: T. A. Richards, Box 78 Methven).

Christchurch.

(District Secretary: L. W. Blackmore, Department of Agriculture, Christchurch).

Darfield (Secretary: James W. Stewart. Box 34, Darfield).—Discussion *re* stacking competition: also sheep-judging competition at Sheffield Show. Secretary to arrange for cricket and tennis matches with the Ellesmere Club. Mr. F. Bull exhibited a series of moving pictures on a "Trip through Australia," "The Year's Work on a Canterbury Farm," and "Interesting Events in the Malvern County." A field-day was held on the properties of Messrs. W. J. Jenkins (Sheffield) and W. W. Mulholland (Darfield). Demonstrations included the following: Half-bred sheep (Mr. L. Jenkins); Southdown sheep (Mr. W. J. Jenkins); farm machinery (Messrs. T. Stewart and R. Thomson). A very successful barn dance was held by the club to raise funds to send a member (E. R. Stewart) to take part in the Y.F.C. shearing championships at Palmerston North. An energetic committee, under the capable leadership of the Club Secretary, transformed Mr. C. O. Redfern's grain-shed into a very serviceable dance floor. About ninety couples danced to music provided by the orchestra consisting of Messrs. A. Hart, W. Pettit, and S. Sherry. The M.C.s were E. P. Stewart, M. Hutton, B. C. Jarman, and I. Gillanders. During the evening an exhibition tap-dance was given by pupils of the Darfield Keep-fit Class. Novelty dances were won by Miss Irene Stewart and Mr. J. Cridge, Miss Thelma Cooper, and Mr. A. Levick, and Miss Betty Reid and Mr. B. C. Jarman. A savoury supper was served. The barn dance was also successful financially, showing a credit balance of £8 5s. 3d.

Dunsandel (Secretary: A. T. Wright, Dunsandel).—Field-day to be arranged. Outline by D. Skinner (club member) of his "days out" with the Lyttelton Harbour Board.

Ellesmere (Secretary: C. S. Tod, Hanmer Road, Irwell R.D.).—Challenge accepted to a tennis match with the Darfield Club, to be played at Leeston on 14th January, 1939. Decided to select one club member as a candidate for the Lincoln College Y.F.C. Scholarship. Address by Dr. Weston, of Lincoln College, on "World Affairs and How they Affect the Farmer." At the previous meeting, Mr. I. D. Blair, of Lincoln College, spoke on "Forestry and its Relation to the Farmer."

Hororata (Secretary: J. T. Thwaites, Hororata).

Ladbrooks (Secretary: M. J. C. Meyer, Springston R.M.D.).

Little River (Secretary: M. G. White, Coach Road Little River).

Springston (Secretary: L. Harris care of Mr. E. J. Harris, R.D., Springston).

Teddington (Secretary: Alan H. C. Nutt, Motukarara, Canterbury).

West Melton (Secretary: G. G. Calder, Halkett R.M.D.). Lantern lecture on "Potatoes and Lucerne" by Mr. J. G. McKay, Department of Agriculture.

North Canterbury.

(District Secretary: A. S. Nash, Department of Agriculture, Rangiora.)

Amberley (Secretary: C. Lavis, R.M.D., Sefton, Rangiora).

Amuri (Secretary: F. H. Belton, Waiau).

Cust (Secretary: C. J. Patient, care of Mr. R. G. Wolff, Horrelville-Rangiora R.M.D.).

Hawarden (Secretary: F. K. Forrester, "Heatherdale," Hawarden).

Oxford (Secretary: N. W. Skurr, "Beck Bank," Carleton, Oxford).—Address by Dr. W. E. Minty on "Hydatids."

Scargill-Omihi (Secretary: H. G. T. Dunbar, care of Mr. D. S. McKenzie, Happy Valley, Motunau).

Marlborough.

(District Secretary: D. R. Wilkie, Department of Agriculture, Blenheim.)

Blenheim (Secretary: Colin R. Laidlaw, "Craigieburn," Blenheim).

Flaxbourne (Secretary: D. F. Matthews, "Glenfield," Ward).

Seddon (Secretary: A. L. Ferguson, Seddon).

Nelson.

(District Secretary: D. Merry, Department of Agriculture, Nelson.)

Dovedale (Secretary: Irvine S. Winn, R.M.D., Wakefield).

Motueka (Secretary: Alan E. Wratt, "The Grange," Motueka).

Motupiko (Secretary: R. J. Read, Motupiko).

Moutere (Secretary: S. Smith, care of Mr. H. R. Holdaway, Lower Moutere).

Wairarapa.

(District Secretary: N. Lamont, Department of Agriculture, Masterton.)

Alfredton (Secretary: N. Napier, "Strath Eden," R.M.D., Eketahuna).

Ballance (Secretary: J. F. Bremner, Ballance, Pahiatua).

Carterton (Secretary: Ian Thompson, Carrington, Carterton).—Five new members enrolled, Report by P. Swinn on the table-tennis match, Masterton *v.* Carterton, won by Carterton by 21 sets to 7.

Eketahuna (Secretary: E. M. Wright, Nireaha, Eketahuna).—Lecture by Mr. W. J. Gray, Government Veterinarian, on "Milk Fever, Grass Staggers, and Paralysis." A number of older farmers attended by general invitation; the audience showed its appreciation of Mr. Gray's lecture by the numerous questions that were asked. Mr. W. James, Chairman of the Wairarapa District Committee, gave a short address on the Y.F.C. movement in the Wairarapa. The club secretary reports that the farmers of the Eketahuna district, both young and old, are now taking full advantage of the opportunities offered by the Y.F.C.

Featherston (Secretary: M. Benton, Kahutara Road, Featherston).

Greytown (Secretary: V. H. Gates, Greytown).—Arrangements for entertaining the visiting South Canterbury members. Practical demonstration on "The Making of Concrete Posts" by Mr. R. Hills of the W.F.C.A.

Mangatainoka (Secretary: K. R. Pryde, Ruawhato R.D., Mangatainoka).

Martinborough (Secretary: D. Ross, Box 44, Martinborough).

Masterton (Secretary: K. Donovan, 58 Opaki Road, Masterton).—Discussion *re* fleece competition to be held in Masterton. Members agreed to collect fleeces from neighbours and friends, the fleeces to be judged and afterwards sold, the proceeds to go to the funds of the District Committee. A club debate was held, the subject being "That a Dairy-farm takes more Managerial Ability than a Sheep-farm." The speakers were as follows: J. S. Mackay, D. McGregor, K. Donovan, J. Wright, and G. Buick (affirmative); G. Blatchford, C. Mackay, L. McLachlan, K. McLachlan, and W. Dalgleish (negative).

Pongoroa (Secretary: T. E. Hall, Pongaroa).

Tinui (Secretary: J. Lancaster, "Waiawa," Whareama, Masterton).

Manawatu.

(District Secretary: G. S. Robinson, Department of Agriculture, Palmerston North.)

Apiti (Secretary: F. V. Viles, Apiti, Feilding).—Report of committee set up to inquire into possibilities of holding a Y.F.C. show. Decided to hold a stock show in February; committee appointed to proceed with arrangements. Each member gave a short address on some farming topic. "Top-dressing" and "Subterranean Clover on Hill Country" were two subjects which caused considerable discussion. "The Management of the Dairy Heifer" also gave rise to debate. Another subject of interest was A Two-hour Breaking-in Method for Hacks."

Bunnythorpe (Secretary: A. Stewart, Ashhurst Road, Bunnythorpe).—Address by Mr. Brownlie, International Harvester Co., on the "Care of Farm Machinery."

Colyton (Secretary: R. J. Shortall, Spur Road R.D., Feilding).

Feilding (Secretary: R. E. G. Mason, Reid's Line, Feilding).—Mr. Stevens spoke on club affairs generally, and suggested activities which would assist in retaining interest in the club. A film depicting the working of an oil-refinery was exhibited by Mr. Lister, of the Vacuum Oil Co.

Fitzherbert (Secretary: N. James, Linton).

Halcombe (Secretary: J. Curtis, Mount Biggs R.D., Feilding).—Arrangements for "lecturette" competition; each member to speak for five minutes. An interesting address was delivered by Mr. K. W. Dalrymple on "A Hunting Trip through the Yukon." Mr. Dalrymple illustrated his talk with moving films taken during the trip.

Johnsonville (Secretary: N. Bryant, Ohariu Valley, Johnsonville).

Kairanga (Secretary: R. Buchanan, "Lockwood," Kairanga, Palmerston North).—Discussion *re* Y.F.C. tours, &c. Suggestions were brought forward by D. Rowland, club chairman, including the inviting of members of other clubs to monthly meetings, and also the holding of a social evening in the near future. Mr. H. B. Low gave an interesting and instructional address on "The Drift to the Cities" and "Farm Prices, their Connection and the Way in which they affect Farming Prospects."

Kimbolton-Kiwitea (Secretary: H. H. Beard, "Stockwood," Kimbolton).

Levin (Secretary: G. F. Gimblett, Box 80, Levin).—Discussion *re* Y.F.C. radio lecturettes. Addresses by Messrs. M. C. Holmes, of Otaki, and R. Wilkinson, of Levin, on "The Felling and Splitting of Trees for Farm Timber" and "How to make Things Last," respectively; the latter subject dealt with woodwork, machinery, &c.

Oroua Downs (Secretary: W. Jarvis, Himitangi).

Otaki - Te Horo (Secretary: R. W. Hillas, Box 35, Otaki Railway).

Paraparaumu (Secretary: H. W. Holland, Box 35, Paraparaumu).

Pohangina Valley (Secretary: A. McDonald, "Wahipa," Ashhurst).

Rangiotu (Secretary: H. Lucas, Mangawhata R.D., Palmerston North).

Rangiwahia (Secretary: S. J. Thompson, Rangiwahia, via Feilding).

Rongotea (Secretary: F. Dear, Kopane R.D., Palmerston North).—A "Parents and Friends Evening" was held. A club debate was held during the evening, the subject being "That the Friesian is a more Profitable Cow than the Jersey." The speakers were as follows: R. Brown, J. Pearson, and F. Dear (affirmative); J. P. Gloyn, M. Huddleston, and H. Hunt (negative). The Advisory President addressed those present and explained the objects of the "Parents and Friends Evening." Supper was provided by the club members. The evening was an unqualified success; in all there were seventy-five people present.

Shannon (Secretary: N. Guerin, Kingston Road, Shannon).

Waituna (Secretary: J. H. Old, R.D., Feilding).

Whakaronga (Secretary: R. G. Scott, jun., Whakaronga R.D.).

Woodville (Secretary: H. G. Goldsworthy, No. 2 R.D., Woodville).

Wanganui.

(District Secretary: A. R. Dingwall, Department of Agriculture, Wanganui.)

Bulls (Secretary: F. J. Thorby, Brandon Hall Road, Bulls).

Hunterville (Secretary: P. S. Weston, Vinegar Hill, Hunterville).—Discussion on report of District Committee meeting. Address by Mr. R. Dukeson on "Concrete Posts."

Marton (Secretary: A. B. Marshall, "Greenbank," Marton).—Decided that the club should give a radio talk on 10th January entitled "Culling the Ewe Flock." Debate arranged with the Hunterville Club, the subject to be "That Farming To-day is more Difficult than it was Fifty Years Ago." Lantern lecture by Mr. B. Tennent, of Massey College, on "Faults of Wood." A successful club dance was held during the month, a profit of £8 17s. being realized.

Taihape (Secretary: S. V. Smith, Taoroa, Taihape).

Waimarino (Secretary: A. G. Mountfort, Raetihi Road, Ohakune).

Westmere (Secretary: C. Goldstone, 21 College Street, Wanganui).—Mr. C. Leach, club delegate to the District Committee, outlined the proposals made at the District Committee meeting regarding the holding of a Y.F.C. camp at Wanganui. An interesting address on his recent trip to England was given by Mr. S. Timbs. The speaker described the type of sheep and cattle in the various counties of England and Scotland. He also dealt with the grades and grading of chilled beef, and the grades of beef and mutton in demand in different parts of England. At the previous meeting, Mr. C. Dickinson, manager of the Westmere Cheese-factory, spoke on "Present-day and Older Methods of Cheese-manufacture."

South Taranaki.

(District Secretary: J. E. Davies, Department of Agriculture, Hawera.)

Alton (Secretary: W. Saggers, Alton, South Taranaki).—Report by Mr. T. Garnett (delegate) on the recent Wellington Council meeting held in Palmerston North. A social evening followed. At the previous meeting arrangements were made for demonstrations in preparation for stock-judging at the Hawera Show. This was followed by an address by Mr. H. Hodge on "The Best Types of Dairy and Show Cattle."

Eltham (Secretary: A. Jenkins, Rawhitiroa, Eltham).—Entries received for stock-judging competition at Hawera Show. Decided to hold a club debate at the January meeting. Lecture by Mr. A. Leslie, veterinarian, on "Parasites in Stock." Numerous questions were asked at the conclusion of the address.

Hawera (Secretary: C. J. Washer, Inaha, Hawera).

Kapona (Secretary: Geo. Gordge, Palmer Road Kaponga).

Lowgarth (Secretary: J. T. Sultzberger, Lowgarth, Taranaki).

Pukengahu (Secretary: R. Bremer, Wingrove Road, Stratford R.D.).—Arrangements for cricket match with Kaponga Club in January. Address by Mr. J. Barnard on "Farm Seeds, their Selection, Certification, and Cleaning Process."

Waverley (Secretary: W. P. Matthews, Box 26, Waverley).

Whakamara-Mokoia (Secretary: I. Buckrill, Whakamara, Taranaki).—Discussion *re* impromptu debate. Address by Mr. N. Howells on "The History and Work of Massey College." At the previous meeting, Mr. L. Julian, factory-manager, spoke on "The Cheese-factory."

Whenuakura (Secretary: W. Honeyfield, Whenuakura, Patea).

North Taranaki.

(District Secretary: G. A. Blake, Department of Agriculture, New Plymouth.)

Cardiff (Secretary: W. Brunton, Cardiff, Stratford).

Hillsborough-Tarurutangi (Secretary: N. T. Sampon, Hillsborough, New Plymouth).

Karawaka (Secretary: L. Oliver, Lepperton).—Arrangements for club debate "Tractor *v.* Horses." Radio lecturette to be prepared entitled "Winter Milk-production." Address by Mr. A. Turnbull, Huirangi, "General Sheep-farm Management." The District Secretary, Mr. G. A. Blake, was present and spoke on Y.F.C. affairs.

Okau-Tongaporutu (Secretary: Owen Collins, Tongaporotu, via Waitara).—Discussion on the future activities of the club. Dance to be held in January. A collection of different varieties of grasses exhibited, the majority of those present being successful in naming them successfully.

Toko (Secretary: L. J. Kilsby, Huiroa R.D., Stratford).—An interesting account of his experiences in Australia was given by W. Lister, a club member who has just returned from a visit to that country. A field-day was held on Mr. J. Weir's farm, demonstrations on the judging of cows and pigs being given by Mr. H. J. Kaye and Mr. Sorensen, respectively.

Urenui (Secretary: K. Phillips, Waitoitoi).—Selection of teams to take part in the stock-judging competitions at Stratford Show. Two field-days were held, one on Mr. W. J. Freeth's property; a judging competition was conducted, three cows being placed in order of merit by members, the competition resulting in D. Feek and V. Graham being equal for first place. The judge, Mr. E. Griffiths, gave a demonstration on the points of a show cow. The other field-day was held on the property of Mr. B. Jonas, an instructive demonstration on the bacon pig being given by Mr. A. Alexander, Tikorangi.

Southern Hawke's Bay.

(District Secretary: J. W. Palmer, Department of Agriculture, Hastings.)

Dannevirke (Secretary: N. Kilford, Private Bag, Dannevirke).

Norsewood (Secretary: B. Anderson, R.D., Norsewood).

Onga Onga (Secretary: Clive W. Masters, Box 18, Onga Onga, H.B.).—Discussion on "Farming Matters in General" by club members. At the conclusion of the meeting a supper of strawberries and cream was supplied by the Advisory President, Mr. E. S. Bibby.

Takapau (Secretary: Maurice N. Tilley, Kurinui, Takapau).—Discussion on proposed field-day and trip to Tomoana freezing-works. Lecture by Mr. A. Sheele on "Farm Book-keeping."

Tirokino (Secretary: H. Eddy, Tirokino, H.B.).

Northern Hawke's Bay.

(District Secretary: R. P. Hill, Department of Agriculture, Hastings.)

Meeanee (Secretary, Lester L. Griffiths, Meeanee, Napier).—Final arrangements for a sports meeting and dance.

Nuhaka (Secretary: N. J. Alexander, Nuhaka).—Arrangements for field-day. Purchase of books for club library. Lecture by R. McIntyre (club member) on "Economics."

Putorino (Secretary: E. Smyth, Raupunga).—Club debate, the subject being "That Grassland Farming pays better than Ploughing and Cropping." In the absence of D. McLean, W. G. Brownlie (Wairoa Y.F.C.) took the lead for the negative. The speakers were as follows: E. Smyth and J. Woods (affirmative); W. G. Brownlie and E. Boustead (negative). Mr. Long acted as judge, and declared the negative side the winners by a margin of 15 points. At the conclusion each member present spoke for two minutes on the debate in general. Mr. Brownlie advised the meeting of an inter-club stock-judging competition to be held at the Nuhaka Show, and also of the Y.F.C. fat-lamb competition to be held at the Wairoa Show, the conditions to be three lambs suitable for export, 36 lb. or under. The District Secretary, Mr. R. P. Hill, drew members attention to a general Y.F.C. meeting to be held at Hastings in connection with the proposed Education Week.

Wairoa (Secretary: W. G. Brownlie, Fraserton, Wairoa).—Report on the Anniversary Dance, which proved an outstanding success and netted a profit of £14 7s. 6d. Recommendation to District Committee that a Y.F.C. stock-judging competition be held at the Nuhaka Show. Discussion *re* subdividing the club into smaller branches; members unanimously against the proposal. Efforts to be made to have stock-sale reports and wool-sales broadcast from 2YH., Napier. Suggestions offered for Educational Week to be held in Hastings in May next. Address by Mr. G. F. L. Hudson, Inspector of Stock, Wairoa, on "The Control of Blackberry."

Poverty Bay.

(District Secretary: E. M. Bates, Department of Agriculture, Gisborne.)

Gisborne (Secretary: G. W. Smith, Box 246, Gisborne).

Te Karaka (Secretary: A. D. N. Manuel, Te Karaka, Gisborne).

Tolaga Bay (Secretary: M. Robison, Tolaga Bay).—Discussion *re* an official visit to the Gisborne Club next February. Lecture by Mr. E. J. Simmons, Government Veterinarian, on "The Treatment of Wounds and Abscesses in Horses." Members showed their interest by asking numerous questions after the address.

Waiapu (Secretary: B. McCosh, Ruatoria).

Taumarunui.

(District Secretary: J. M. Hopkins, Department of Agriculture, Taumarunui.)

Taumarunui (Secretary: L. G. Smith, Patunga, Taumarunui).—Election of advisory officers and general routine business. Address by Mr. F. Duncan on "How to Conduct a Meeting."

Te Kuiti.

(District Secretary: K. M. Montgomery, Department of Agriculture, Te Kuiti.)

Aria (Secretary, E. A. Riddle, Aria).

Otorohanga (Secretary: C. G. Murphy, Te Kuiti Road, Otorohanga).

Te Anga (Secretary: H. O. Goddard, Te Anga R.D., Te Kuiti).—General business, and election of new Chairman, H. Wright, owing to the resignation of G. Butcher. Arrangements for presentation to G. Butcher, who has left the district; also arrangements for dance in Te Anga Hall on 26th December, 1938.

Eastern Bay of Plenty.

(District Secretary: C. R. Taylor, Department of Agriculture, Whakatane.)

Edgecumbe (Secretary: R. Strachan, care of Mr. G. W. Mexted, R.D., Whakatane).—Arrangements for a cricket match with the Waimana Club. Discussion *re* the Ruakura Rally and Y.F.C. Courts at the Waikato Winter Show; also arrangements for stock-judging competitions.

Opotiki (Secretary: I. O. Grant, Woodlands, Opotiki).—Discussion *re* the Waikato Winter Show and stock-judging competitions. Decided that at the next meeting each member should speak for five minutes on "How to Improve the Club." Arrangements for a field-day at Mr. Thompson's farm. A successful field-day was held at the Opotiki Dairy Association Piggeries, the demonstrations including "Devon Boar" and "Dip for Pigs" (Mr. Beattie) and "Tamworth Sows" (Messrs. Reenberg and Beattie).

Taneatua (Secretary: W. Garlick, Taneatua).—General business, and election of new chairman, F. Read, owing to the resignation of L. McCready.

Waimana (Secretary: C. R. White, Waimana).—Members advised of rally to be held at Ruakura next July, and the courts for competition at the Waikato Show. Arrangements for club dance. Lantern lecture by Mr. Hodson, Bacteriologist, Rangitaiki Dairy Co., on "Bacteria in Milk, and their Control."

Western Bay of Plenty.

(District Secretary: A. V. Allo, Department of Agriculture, Tauranga.)

Katikati (Secretary: R. F. Walford, "Foxbro," Katikati).—Lantern lecture by Mr. A. V. Allo, Department of Agriculture, on "General Farm Management."

Omokoroa (Secretary: E. Emeny, Omokoroa).

Paengaroa (Secretary: A. F. Walter, Rongakawa R.M.D., Te Puke).—Decided to hold a social in January. Lecture on "Maize Growing" by Mr. W. T. Black (an advisory member). Address by Ned Marsh (club member) entitled "My recent Trip to Sydney and Tour of New South Wales." Short talks by members as follows: "Points of a Jersey Cow" (Alan Riddell), "A Trip Down the East Coast" (Neville Wickham), "Ragwort Control" (Alan McClure), "A Trip to Wairoa at Time of Easter Flood" (Jim McClure), "Points on Judging Dairy Stock" (Jack Gulliver), "Dipping Sheep" (Jim McDowell), "Rearing Calves" (Sam McDowell).

Tauranga (Secretary: W. R. Hamilton, R.D., Tauranga).

Te Puke (Secretary: A. D. McNaughton, Box 42, Te Puke).

Waihi (Secretary: B. Thornton, Waitekauri, Waihi).—Arrangements for club debate at January meeting. Lantern lecture by Mr. A. V. Allo, Department of Agriculture, on "General Farm Management."

Rotorua.

(District Secretary: C. S. Dalgleish, Department of Agriculture, Rotorua.)

Horo Horo (Secretary: T. D. Kingi, Box 174, Rotorua).

Ngakuru (Secretary: J. E. Willoughby, Ngakuru R.D., Rotorua).

Putaruru (Secretary: S. G. Penwarden, Putaruru).

Rotorua-Ngongotaha (Secretary: E. L. Lewis, 58 Malfroy Road, Rotorua).

Waikato.

(District Secretary: J. F. Shepherd, Department of Agriculture, Hamilton.)

Huntly West (Secretary: J. H. Furness, Ruawaro, Huntly R.D.).—Field-day at Mr. C. Bailey's Ayrshire stud farm, Huntly South. An address on "Method in Breeding" was delivered by Mr. F. A. Knight (N.Z. Herd-testing Association), and a demonstration on "Dairy Type" was given by Mr. C. Bailey. There was a total attendance of twenty-two.

Kakepuke (Secretary: H. W. Budden, Te Kawa R.D.).

Matamata (Secretary: S. K. Duxfield, Station Road, Matamata).

Matangi (Secretary: J. R. Ranstead, Matangi).

Te Aroha (Secretary: J. P. Hunt, Box 58, Te Aroha).

Te Kowhai (Secretary: Ivan Porter, Te Kowhai R.D.).

Auckland.

(District Secretary: J. E. Bell, Department of Agriculture, Auckland.)

Maungatawhiri (Secretary: G. Quick, care of Mrs. C. Peach, Maramarua).—Decided to arrange for a court at the Waikato Winter Show. Club debate, the subject being "Horse *v.* Tractor." Mr. J. E. Bell, District Secretary, acted as judge, and gave his decision to the side favouring the horse.

Whangarei.

(District Secretary: E. B. Glanville, Department of Agriculture, Whangarei.)

Matarau (Secretary: Ian D. Bodle, Matarau R.D.).

Maungakaramea (Secretary: C. W. Timperley, Maungakaramea).

Dargaville.

(District Secretary: E. H. Arnold, Department of Agriculture, Dargaville.)

Arapohue (Secretary: J. T. Studholme, Mitata Dargaville).

Marohemo (Secretary: J. Petrie, Maungaturoto Railway R.D.).—Selection of delegates to District Committee (M. Wallis and N. Fergus). Club debate, subject being "Tractors *v.* Horses," won by team supporting tractors.

Ruawai (Secretary: E. Barnes Walker, Parahi, Matakohe).—Discussion *re* hire of hall for meetings and arrangements for lighting. Lantern lecture by Mr. E. H. Arnold, Department of Agriculture, on "Hay and Ensilage." Mr. Arnold also outlined the suggested itinerary of a proposed Y.F.C. winter tour. A number of members of the Farmers' Union were present by invitation, and followed Mr. Arnold's lecture with interest.

Kaitaia.

(District Secretary: E. Moss, Department of Agriculture, Kaitaia.)

Broadwood (Secretary: B. Rogers, Broadwood, Hokianga).—Arrangements for a field-day to be held in conjunction with the local calf clubs. Addresses by Mr. J. McKenzie and Mr. Copland on "Horses" and "Dew-ponds" respectively. At the previous meeting a debate was held, the subject being "That Conservation of Feed is Essential to Sound Farming Practice." The speakers were as follows: R. Proctor and H. Proctor (affirmative), D. Hawkins and B. Rogers (negative). The decision was given to the side supporting the affirmative.

Herekino (Secretary: Dave McKeay, Herekino).

Kaeo (Secretary: J. R. Brighouse, jun., Kaeo).—General business. Discussion took place on the following: "Tree-planting Scheme," "District Committee Meeting at Umawera," "Preparing a Paddock for Hay," and "Cattle-judging Competitions."

Kaitaia (Secretary: H. C. Hooper, Box 26, Kaitaia).

Oruru (Secretary: O. F. Packard, R.D., Mangonui, Oruru, Kaitaia).—Decided to hold a club debate at the next meeting. Lecture by Mr. J. McKenzie, of Broadwood, on "Agriculture on the Farm." At the previous meeting N. Barriball, delegate to the Auckland meeting held at Hamilton, gave a resume of the business transacted. At this meeting it was decided to make inquiries, through the Department of Agriculture, regarding the gorse weevil. A "working-bee" was held at the Oruru School to prepare a plot of ground for the propagation of shelter-trees.

Umawera (Secretary: K. R. Webber, Umawera, Kaitaia).

Health Notes for the Farm.

Contributed by the Department of Health.

Hydatid Disease and its Prevention.

ALL countries have their distinct racial and geographical characteristics, and, to a certain extent, they have their own disease characteristics. Thus cholera suggests to the mind India, yellow fever we associate with Brazil. Mexico, Central America, and the West Coast of Africa. In the case of hydatid disease we think of stock-raising countries where there are many dogs. Thus this disease was first studied in Iceland, where shepherds pass their days in companionship with dogs and sheep amid the mighty geysers of that island. It is also common in Australia, South Africa, Algeria, South America, and New Zealand, particularly in rural areas where man is brought into close contact with dogs.

Sir Louis Barnett states that there were 587 cases of hydatid disease admitted to our public hospitals during the last five years and that in 1937 there were fourteen deaths from this disease.* It should be remembered, also, that this disease, when not fatal, usually necessitates a long period of disability and enforced idleness, and that the individuals affected are for the most part young people engaged in useful agricultural and pastoral pursuits. The disease commonly dates back from childhood, for it may exist in latent form for twenty years or more.

The Start and Spread.

The Hydatid Research Department of the Medical School, University of Otago, points out in its folder on the prevention of this disease how hydatid disease starts with tiny tapeworms getting into the intestines of dogs, usually country dogs, that eat raw offal. There are many kinds of tapeworms—some of them yards in length and actually resembling tape—but the hydatid tapeworm is only about a quarter of an inch long. It makes up for its small size by occurring in large numbers.

* *New Zealand Medical Journal*, August, 1938.

Hygeia.

I am Hygeia,
Daughter of Aesculapius and Epione
And child of the full-fruited hills of Greece.

I am Hygeia, Goddess of Health;
Come, follow me up the mountainside
From the valley of sediment to the summits of purity.
I will put the breath of violets in your nostrils;
I will make your eyes like the windows to a cloudless morning;
I will pour the fresh roses of dawn in your Blood.

I am Hygeia,
And I come wherever men call me.
I walk in the gutters and give them the beauty of meadowlands
Flaming with flowers. I knock at the hovel
And turn all the windows to casements,
Its doors into portals. I hang on its walls in the sunlight
The rich tapestries of clean thoughts.

I am Hygeia;
Give me the prose of the city,
And I will set it to exquisite music.
Give me the wombs of the mothers
And I will banish forever the darkness of birth.
Give me the limbs of the children
And I will give them a power and a fleetness
That shall outdistance all sickness
And folly and woe and the travails of childhood.
Give me the youths and the maidens
That I may turn their cravings towards wisdom.
Give me the mothers and fathers
And I will transform all their gardens to kingdoms,
Their homes into places. I am Hygeia,
Goddess of Health, crying over and clamouring
To regain once more the lost multitudes.
Will you not walk with me?
Will you not aid me?

Despair, despair—away forever:
Hygeia comes—the old sores are healing,
The hopeless smile again, the outcast starts anew
O blessed offspring of Aesculapius and Epione,
I walk with thee to a new heart.

—ANON.

The microscopic eggs of these worms are passed in countless numbers in the dogs' droppings. These dangerous droppings are trampled and scattered as dust, and contaminate the nearby grass and other vegetation and water-supplies. Stock and animals, and sometimes human beings, can thus become infected as they eat and drink. Flies may also spread infection from dogs' droppings to foodstuffs. The egg-laden dust gets on to the hairy coat, muzzle, and paws of dogs, and on to the woolly fleece of sheep.

Human beings who come into close contact with the animals get their hands contaminated with hydatid eggs, and transfer of infection from hands to mouth can easily occur. This is now regarded as the most likely path of human infection, especially in the case of children.

Hydatid Cysts.

It is a peculiarity of all tapeworms that they pass the worm stage of life in one animal and a cyst or water-bladder stage in another quite different animal. Hydatid eggs passed in the droppings of dogs and swallowed by other animals, such as sheep, cattle, pigs, or horses, undergo a transformation into hydatid cysts or water-bladders. This is also the case with human beings.

The eggs hatch out in the stomach or intestine into microscopic parasites, which penetrate deeply and settle anywhere in the body, but most commonly in the liver or lungs, where they grow in the course of months or years not into worms, but into cysts or water-bladders. These cysts, at first very small, may reach the size of golf balls, cricket balls, or even footballs.

Economic Loss to the Farmer.

Sheep and cattle are very commonly affected with cysts in liver and lungs—more often than not in some districts—and their monetary value is thereby lessened. Although these animals may appear healthy it is reasonable to assume that their constitution and the quality of both meat and wool may be depreciated more or less, and quality in New Zealand products is of paramount importance.

Moreover, the economic waste involved in the condemnation of millions of sheep's livers every year as being unfit for food because of the cysts they contain must be very considerable. As a matter of fact, such livers, although repellent, are not actually dangerous to human beings or to any other animal except the dog, and then only if eaten raw. So the dog becomes infected by eating raw offal, such as sheep's liver containing hydatids, and multitudes of hydatid eggs are passed with the dogs' droppings. Thus a vicious circle is produced and hydatid disease is perpetuated.

Precautions.

These precautions have been drawn up by the Hydatid Research Committee of the Medical School after consultation with the Government Departments of Health, Agriculture, and Education, and they have the influential support of Lord Galway, the Governor-General, and of high authorities in our pastoral industry.

(1) *Of Highest Importance.*—Never feed dogs on the raw offal (liver, lungs, plucks, lights) removed from the carcass of a sheep, because that is the way to infect the dogs with tapeworms, which then spread hydatid disease among human beings and farm animals in the form of cysts. This offal can easily be made safe and wholesome by slicing it into three or four pieces and boiling it in water for ten minutes. If those in charge of dogs do not wish to carry out this simple boiling process they should discard the offal altogether as food for dogs, throw it in the fire, and feed their dogs on other parts of the sheeps' carcass.

(2) Dose dogs regularly every three months with the worm-destroying tablets supplied with full instructions to all owners each year at the time of dog registration. This regulation comes into force on the 1st January, 1939, in accordance with the Dog Registration Amendment Act passed by the New Zealand Parliament without opposition in 1937.

(3) In patting or fondling dogs, handling sheep, and so on, remember the risk of contaminated hands and the possibility, especially in children, of the hydatid eggs being transferred from hands to mouth. Make a practice of washing the hands before meals.

(4) Foodstuffs should be protected against direct pollution by dogs and indirect contamination by flies. Salads and other vegetables that are eaten raw should be carefully washed.

(5) Hydatid eggs which reach water soon sink, and infection from this source is not very likely, but to be on the safe side water for drinking purposes should be boiled or filtered.

Hydatid disease is preventable, and the Government appeals for the co-operation, particularly of the farming community, to banish it from New Zealand. If all dog-owners faithfully carry out the instructions issued with the tablets supplied at date of registration the time should not be far distant when New Zealand's unenviable position as regards the incidence of this disease will be one of the past.

Farmers!

GUARANTEE

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The Farm Home and Kitchen.

Contributed by the Association for Country Education.

General Principles of Preserving.

MOST industries have existed in some form for a long time, but the preservation of foodstuffs by canning or bottling is distinctly a modern art. Among English-speaking people, at least, there developed with the years a kind of basic diet composed mainly of meat, bread, boiled vegetables, and desserts, but as the science of nutrition came into being this basic diet was criticized as failing to meet certain health requirements.

Experiments showed, however, that these defects could be remedied by supplementing such a diet with plenty of milk, fruit, and green vegetables, and of recent years there has been a marked increase in the use of these protective foods and also, incidentally, in the general health of the community.

Topical Questions.

If we are to have a variety of these foods all the year it is necessary that we take advantage of a season of plenty and preserve foodstuffs. Several questions are constantly being asked :—

Is fruit out of a bottle a satisfactory substitute for the fresh article ?

Are preserved foods wholesome ?

Will children grow better on fresh than on preserved products ?

Although, strictly speaking, bottled fruits and vegetables are not the equivalent of fresh, they certainly provide us with a good substitute. We realize this when we consider why nutrition experts have advocated a greater consumption of fruits and vegetables. It is largely because of their vitamin content, their mineral salts, their alkaline residues, and the bulk and roughage they add to the diet. They also contribute some tissue-building and heat- and energy-giving factors, but these are usually abundantly supplied in other food articles, so that we need not be particularly concerned with the effect of preserving on these, beyond noting that very little loss occurs.

No Loss of Minerals.

The loss of mineral matter is also negligible. Preserving has not eliminated any minerals, although concentration, as in puréeing, or dilution by water, as in bottling, may affect the percentages slightly. Since the importance of vitamins has been realized, research has centred on the effect on vitamins of bottling, and well-known authorities in the United States actually measured the vitamin content of fruit and vegetables—first, in the raw state ; secondly, after preparation by the usual home cooking recipes ; and, thirdly, after bottling. As a result, they discovered that there was a considerable loss of vitamin C—a very necessary health factor—but that otherwise the vitamin content remained much the same.

On contrasting ordinary cooked and bottled products they found that bottling preserved vitamin C better than ordinary cooking, the reason for this being that vitamin C is destroyed more rapidly by heat when oxygen is present. This is one reason why we prefer bottling by the cold-pack method to the older method of cooking fruit in a syrup and transferring it to sterilized jars.

For the general health, fresh fruits and vegetables are best, but, failing these, bottled ones provide an excellent substitute. In addition to preserving when the season is at its height we decrease the total food expenditure, as well as aiding ourselves with menu-planning during the winter months.

Preventing Decay.

Fruit decays because of certain enzymes in the fruit which cause it to break down when it becomes overripe, and also because of bacteria, yeasts, and moulds which are present in the air. Hence, if we are to preserve successfully we must stop the enzyme action, kill bacteria, yeasts, and moulds which are already present, and prevent others from acting on the food. There are three ways of doing this—by the use of a high temperature, as in bottling ; by the use of harmless preservatives, *e.g.*, salt, sugar, vinegar ; and by the removal of moisture, as in drying.

The "cold pack" method has been found to be most satisfactory. The directions for this method are :—

(1) Test jars, rubbers, and lids to make sure they give an air-tight seal. To do this, partly fill the jar with water, adjust the rubber, screw on the lid, and leave the jar upside down on a dry surface for several hours to test for leakage. Time thus spent is well worth while.

(2) Prepare the syrup, the thickness of which depends on the kind of fruit to be preserved and the richness of the product desired. There are three types : Thin, made from one cup of sugar and three cups of water ; medium, made from one cup of sugar and two cups of water (this is the most commonly used) ; and thick, made from one cup of sugar and one cup of water. Bring the sugar and water to boiling-point. In judging the amount of syrup to make it is helpful to know that the large fruits require

about two cups of syrup to a quart jar and the small fruits about one cup and a half syrup to a quart jar.

(3) Select firm, ripe fruit (except gooseberries, which are preserved green) and prepare it. For instance, peaches would be blanched by plunging them into boiling water and then into cold water, the skins removed, the peaches cut in half, and the stones removed to facilitate packing.

(4) Remove all bruised or decayed parts, and pack the fruit firmly in the clean, tested jars. Stand the jars on a cloth in a basin containing a little warm water, and add the hot syrup to overflowing.

(5) Place a new rubber on each jar, adjust the cover, and partly seal. This is done by adjusting one clamp only, or, if "screw" tops, the lids should be screwed on, then given one half turn back to allow the air to escape during processing.

(6) To process, set the filled jars on a rack in a hot-water bath (a kerosene-tin cut lengthwise or a washing-copper will do very well). Cover the jars with water, which should be at about the same temperature as the jars, to prevent cracking. Do not count the time until the water comes to the boil, and keep it boiling during the whole time of processing. The times for quart-size jars are: Small fruits and berries, ten to twenty minutes; quinces, twenty minutes; cherries, twenty-five minutes; peaches, pears, plums, rhubarb, twenty to thirty minutes; apricots, thirty minutes.

(7) Remove the jars, drain them, and set them on a dry cloth away from a draught to prevent cracking. Screw on the lids tightly, and turn the jars upside down to test for leakage. If there is a leak, find the cause, remedy it, and reprocess the jars for half their original time. Store in cool place.

Bottling Poultry.

Roast Fowl.

Roast the fowl in usual way until more than half cooked, remove the flesh from the bone and pack tightly into hot jars while still hot, pouring over hot gravy. Adjust the lids nearly tight, and cook three hours in boiling water or for one hour and a half on two succeeding days. Be sure, if using the latter method, to screw the lid tight when the bottles are removed from the boiler the first time, and leave it still tight when putting in to cook the second time. When finally removed, give a final twist to try to get a tighter fit, if possible. Two fowls of about 2½ lb. each (dressed weight) will fill a 1 quart jar.

Stewed Chicken.

Cut up the birds and stew gently until nearly cooked in a stock containing a little onion and seasonings. Remove the flesh from the bones, being careful not to cut into unnecessarily small pieces. Reheat in the stock, and pack into hot jars. Process as usual for three hours, or for one hour and a half on each of two days. Another method is to pack the meat raw into the jars and to cook one hour and a half per day for three days. The pre-cooking method is generally preferable to this method.

As a reminder, time the cooking from when the water boils around the jars, and tighten the lids the moment the jars come out of the water. When finished, put the jars in a cool place and keep an eye on them for a day or two. If there is no sign of spoilage they may be safely stored in a cool place until wanted.

"Bridegroom's Cake."

1 lb. of brown sugar.
1¼ lb. flour.
1 lb. butter.
18 eggs.
1 lemon, juice and grated rind.
1 orange, ground skin and all.
1 teaspoonful cinnamon.
½ teaspoonful mace.
1 teaspoonful grated nutmeg.
1 cupful of molasses.
1 cupful brandy, or, if not obtainable, 1 cupful white and dark grape juice.
2 lb. figs.
2 lb. whole cherries.
2 lb. candied citron.
1 lb. candied orange-peel.
2 lb. candied pineapple.
6 lb. muscatel raisins, seeded.
3 lb. currants.

Method.—Preparations for this cake must be carefully made in advance, and every effort to have the fruits the choicest of their kinds. Cut the citron, lemon-peel, orange-peel, and figs carefully into thin pieces. Wash the currants and raisins. If you have brandy, soak the fruit in it over night. Scorch the flour in the oven till it is a light brown.

The cake is put together in the usual way. The butter is creamed, and the sugar and spices added; then the liquids and flour alternatively; then the eggs, beaten lightly. Last of all, the fruit, a little at a time, is gently lifted into the mass until it is all incorporated.

Rub the sides and bottom of a round cake-tin with fresh unsalted butter, and sprinkle this with very finely sifted macaroon crumbs. Set this cake-ring on a large baking-pan, in which enough water has been put so that it will not evaporate in less than an hour. Set this into a moderate oven. Much time must be given to this baking. The person who has made the cake should observe it carefully, and be sure not to remove it from the oven until it is thoroughly baked. This will take about three hours.

Let the cake stand until nearly cool; then sprinkle upon it from a spray enough brandy to moisten it. Then cover it and set it away for twenty-four hours, until the brandy is absorbed into the texture of the cake.

The best decoration for the cake is made of fresh candied fruits—cherries, figs, pears. Any candied fruits are appropriate if they are perfectly fresh.

Have We Lazy Minds?

A HOUSEWIFE asks: "Have we lazy minds?" When the time comes that we no longer try new recipes, change the rooms around, or read the fashion books, we should look into ourselves to find the reason. Are they too expensive, would they take too much time, or are we trying to conceal the fact that we are just plain lazy?

Often the hardest part of making a new dish is in making up our minds to make it. We have never had it before, and, though it sounds good, perhaps the family wouldn't like it. We had better have rice custard again. And perhaps the other pudding wouldn't turn out well, anyway.

So runs our trend of thought, and we have rice custard. But how can we know our families won't like it until they try it? And how do we know that because our best dress has always been shiny black satin our next one should not be a light soft crepe de Chine? Let us try a few of the good ideas we read about, and get out of our ruts.

✣ ✣ ✣

Recommended Recipes.

Wheatmeal Fruit Cake.

½ lb. butter.
1 lb. mixed fruit.
4 eggs (well beaten).
¼ teaspoon cream-of-tartar.
12 oz. wheatmeal.
Peel and nuts to taste.
10 oz. sugar.
¼ teaspoon baking-powder.

Method.—Beat butter and sugar; add eggs; add fruit and essences; lastly wheatmeal, cream-of-tartar, and baking-powder. Bake one hour and a half in steady oven; electric oven, 325° F. to 350° F.

Christina's Ginger Cake.

1 cup (7½ oz.) brown sugar.
1 cup (12 oz.) treacle.
1 cup (½ lb.) butter (or part substitute).
3 eggs.
3½ cups flour (⅞ lb.).
1 tablespoonful soda.
½ tablespoonful ginger.
1 tablespoonful cinnamon.
¼ teaspoonful cloves.
½ teaspoon allspice.
1 cup boiling water *or* 1 cup boiling coffee.

Method.—As for butter-cake mixture. Add hot water with soda dissolved in it at the end. Bake in loaf tin in moderate oven (340° F. to 350° F.) forty-five minutes or until cooked. Serve hot with whipped cream.

Apple and Raisin Stuffing.

(*For Goose and Turkey.*)

½ cup diced salt pork or bacon.
1 cup chopped celery.
1 cup chopped onion.
7 cups breadcrumbs.
½ cup chopped parsley.
6 medium tart apples, diced.
1 cup seedless raisins.
¼ to ½ cup sugar.
2 teaspoonfuls salt.
¼ teaspoonful pepper.

Method.—Fry pork or bacon until crisp. Remove pieces. Cook celery, onion, and parsley in the fat three minutes and remove. Put apples (diced) in the fat, sprinkle with sugar, cover, and cook slowly until glazed. Add crumbs, pork strips, celery, onions, parsley, and seasonings. (Sufficient for 10 lb. to 12 lb. bird.)

Strawberry and Gooseberry Jam.

Method.—Use one cup strained gooseberry-pulp to every 2 lb. of strawberries and 2 lb. of sugar. Boil the strained gooseberry-pulp with the strawberries until they are well pulped, and then add the sugar. Boil to 222° or until the jam sheets from the spoon. (Use strawberries which are rather on the green side of ripe.)

Honeyed Strawberries.

Method.—Take equal weights of liquid honey and ripe, tailed, washed, and well-dried strawberries. Mix well without breaking the berries. Set to dry in a very cool oven or under glass in the sun. In a day or two, when the berries become bright and clear and the syrup thickens to the consistency of fresh honey, pack all into clean, sterilized jars, seal, and cook in a water bath for twenty-five minutes at 190°.

Gooseberry Marmalade.

6 lb. gooseberries.
11 lb. sugar.
10 breakfastcupfuls water.
4 lemons.

Method.—Boil gooseberries, lemons, and water for one hour. Then add sugar, and boil for three minutes.

Broiled Kidneys.

Method.—Trim, split, and grill ten minutes. Arrange on pieces of toast, pour over melted butter, seasoned with salt, cayenne, and lemon juice.

Kidney Rolls.

Breadcrumbs, ½ cup.
Onion, 1 small.
Parsley chopped, 1 teaspoon.
Egg, 1.
Slices of bacon, 8.
Lambs' kidneys, 2.
Salt.
Pepper.

Method.—Mix breadcrumbs, chopped onion, parsley, and seasonings in bowl and moisten with egg. Spread mixture on thin slices of bacon, fasten around pieces of lamb's kidney, using skewers. Bake in oven of 375° F. for twenty minutes.

Bread Stuffing.

(*For a 5 lb. bird.*)

6 cups breadcrumbs (twenty-four hours old).
¾ cup butter or dripping.
2¼ teaspoonfuls salt.
¾ teaspoonful pepper.
2 eggs (beaten).
1½ teaspoonfuls mixed herbs or spiced poultry seasoning.
1 medium-sized onion, chopped, and cooked in a little milk or butter.

Method.—Rub the butter into the crumbs. Mix the remainder of the ingredients thoroughly with the butter-breadcrumb mixture. The eggs may be omitted if the dressing is to be eaten hot. For variation, add any of the following: Mixed giblets, or ¼ lb. of minced ham (specially suitable for veal, turkey, or fowl, all of which are dry meats rather low in fat), or 1 lb. mushrooms fried in butter (this gives a dark stuffing with a delicious flavour), or ½ lb. of stewed and sieved tomatoes, or 1 quart of oysters bearded and strained. For turkey, 2 lb. sausage-meat may be substituted for all the crumbs except half a cup, and the eggs omitted also.

Oyster on the Half Shell.

Serve oysters on deep halves of the shells, allowing six to each person. Arrange on plates of crushed ice, with one-fourth of a lemon in the centre of each plate.

Stewed Kidneys.

Kidneys, 2.
Bacon (slices), 3.
Onion (small), 1.
Mustard, ¼ teaspoon.
Salt, ¼ teaspoon.
Pepper, shake.
Water, 1 cup.
Flour, ½ tablespoon.

Method.—Remove skins from kidneys, cut in pieces and place in saucepan with the water. Bring slowly to the boil, skim, add sautéd onion and bacon cut in dice. Simmer until tender. Add pepper, salt, and thicken with the flour and mustard mixed to a smooth paste.

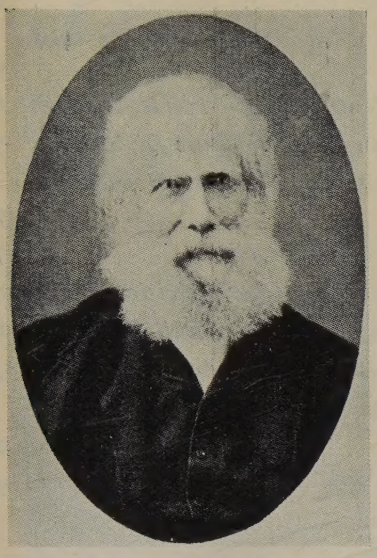
Founders of Modern Agriculture, No. 13.

J. W. WOODCOCK, Crop Experimentalist, Fields Division.

James Harrison and Thomas S. Mort.

ALTHOUGH it is difficult to credit any one person with the discovery of refrigeration, the names of James Harrison and Thomas Sutcliffe Mort stand out boldly among the pioneers and experimenters who laid the foundation of the frozen-meat trade.

James Harrison (1816–1893) was born in Glasgow, and after emigrating to Australia in 1837 he became a journalist



James Harrison.

of some repute and edited the *Melbourne Age*. In his leisure moments he devoted his time to experiments with an icemaking scheme, and eventually succeeded.

In 1850 Harrison erected his first ice-factory, and a year later a Bendigo firm of brewers installed a refrigerator of the Harrison type. Still not satisfied with the details of the method, Harrison corresponded with Faraday, the noted scientist, and Siebe Bros., the engineers, of London, who invited him to come to England and superintend the erection of a more perfect machine. After some time in London Harrison returned to Australia with a large machine which was capable of refrigerating meat satisfactorily.

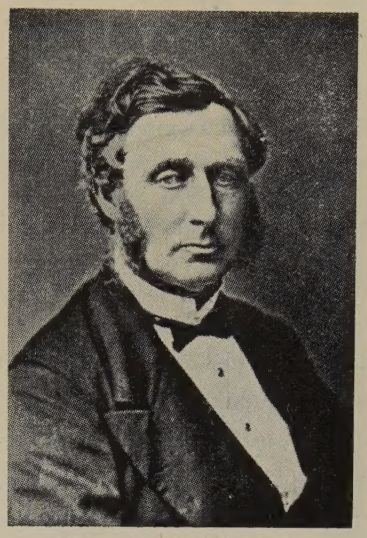
In 1873 Harrison arranged space on the s.s. "Norfolk" for consigning frozen meat to England, but during the voyage the tanks containing the freezing-mixture leaked, and on arrival at London the meat was unsaleable. This was a severe blow to Harrison, and not only dashed his hopes but caused him considerable financial loss.

He sought retirement in London, where he devoted his remaining years to scientific study. Harrison's invention of the icemaking process, however, was epoch-making, and without doubt laid the foundation for prosperity in New Zealand and other primary-producing countries.

Thomas Mort (1816–1878) was a contemporary of Harrison, and in conjunction with Eugene Nicholle, an engineer, carried out many experiments in the freezing of meat. Mort was born in Lancashire, and emigrated to Australia at the age of twenty-two, later founding the firm of Mort and Co., wool-brokers.

Mort and Nicholle took up the subject of freezing meat for export, and in 1861 established at Sydney the first freezing-works in the world. Mort spent vast sums in improving the technique of freezing, as he realized the immense possibilities which were to be opened up by a successful shipment of meat to Great Britain.

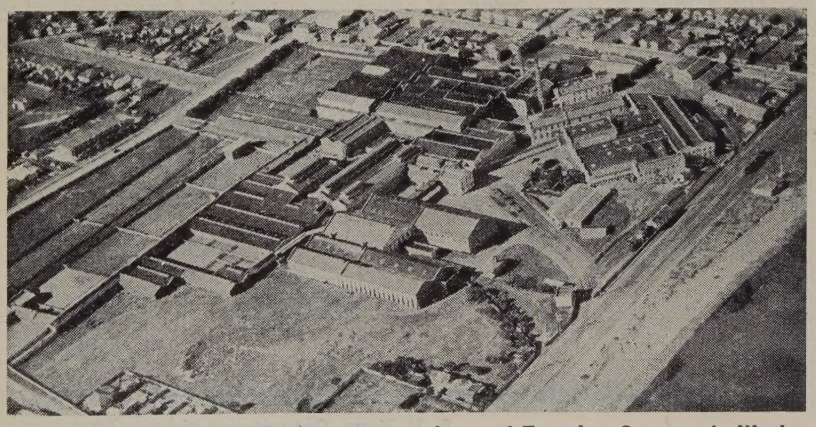
He arranged a trial shipment to England in 1876, chartering the sailing ship "Northam" for the purpose, and installed on board an ammonia installation similar to that used in his freezing-works. Before the ship had cleared the harbour, however, it was apparent that the ship's movements were likely to cause the brine-pipes to burst and thus damage



Thomas Sutcliffe Mort.

the cargo. The meat had to be discharged, and the failure of the enterprise was a severe blow to Mort and actually hastened his death.

Although Harrison and Mort had both independently established methods of storing meat for considerable periods on land, the problem of sending shipments to England remained for others to solve, and it was the French scientist and engineer, Charles Tellier, who was responsible for the first shipment of meat cargo under refrigeration from Buenos Aires to Rouen in 1877.



An aerial view of the Gear Meat-preserving and Freezing Company's Works at Petone. Harrison and Mort were the pioneers of refrigeration.

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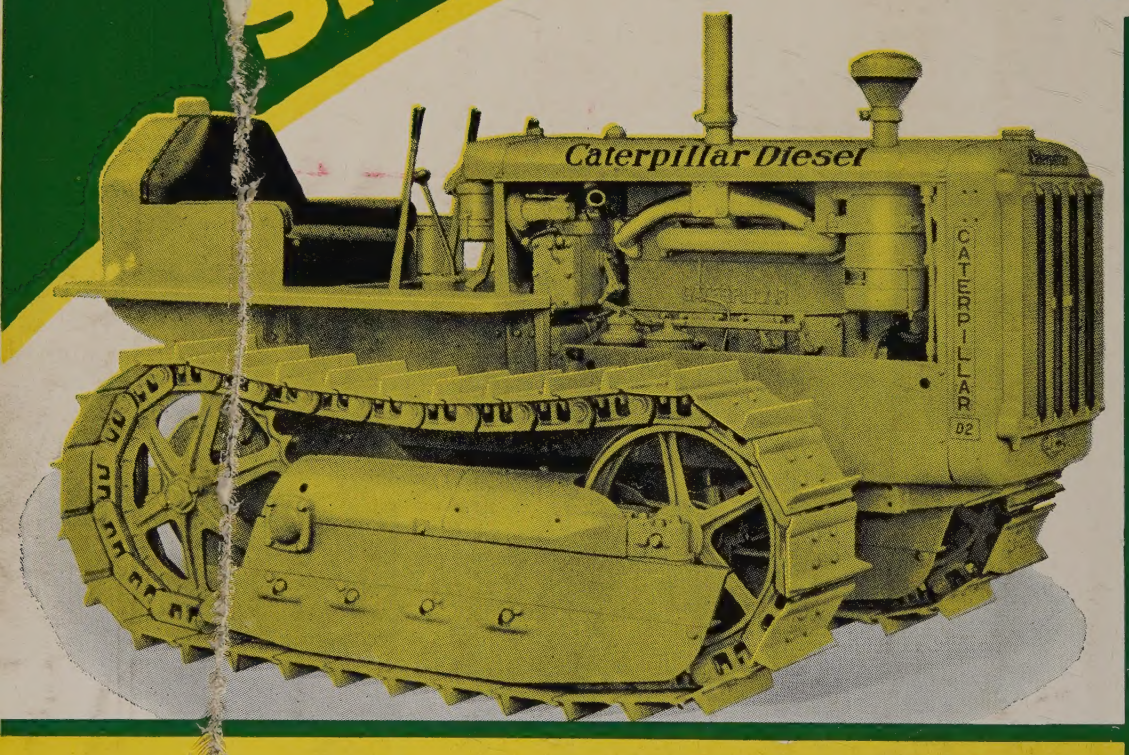

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